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Evolution of the eCHAT
Case-finding to improve health and happiness

Felicity Anne Goodyear-Smith

A thesis submitted in partial fulfilment of the requirements for the degree of MD
The University of Auckland, 2011
ABSTRACT

Introduction: Risky lifestyle behaviours and mental health issues have considerable impact on health and well-being, therefore early detection and intervention in general practice is likely to have substantial long-term health gains. However general practitioners have time restraints in systematically exploring these issues when patients consult for other reasons, and patients may feel disquiet when asked about specific “bad” behaviours in isolation. A patient-centred approach is for patients to self-administer an instrument dealing with multiple domains in which they can identify unhealthy behaviours or problematic mood states, and indicate which if any they would like help to address.

Aims: To describe the development of the Case-finding and Help Assessment Tool (CHAT) designed to identify unhealthy behaviours and negative mood states in primary care and community settings, and report on various studies assessing its feasibility of use, acceptability, validity (including the innovative Help question) and progression of the electronic version, eCHAT.

Method: Various studies were conducted in NZ primary care and community settings to evaluate the feasibility and acceptability of CHAT amongst diverse ethnic adult populations and to validate both the tool and the innovative Help question against appropriate reference standards. Initial acceptability and feasibility testing of the eCHAT was conducted.

Findings: CHAT is feasible to use in primary care and community settings, has high patient and provider acceptability and has criterion-related validity. eCHAT allows for added diagnostic tools and integrated decision supports.

Conclusion: The CHAT differs from existing tools because it is a generic approach for all adults looking at both behaviours and mood states that impact on health and well-being, with a whole-person not a disease focus. It builds on current theoretical models of behavioural change. It is positioned to contribute to contemporary national and international integrated models of primary care delivery which are premised on the concepts of patient-centredness, joint decision-making and self-management. The eCHAT has important clinical, policy and research implications regarding individual health care, population-based strategies and health promotion. While this thesis focuses on work conducted between 2001 to 2010, research and implementation of eCHAT is progressing in primary care and community settings in NZ and internationally.
DEDICATION

This thesis addresses a tool which aims to help people choose healthier behaviours and lift their mood, and is dedicated to all those who wish to improve their health and happiness.

“Our bodies are our gardens, to the which our wills are gardeners”
William Shakespeare, Othello, The Moore Of Venice, Act 1, Scene 3
ACKNOWLEDGEMENTS

Funding for various aspects of this work was provided by the Oakley Mental Health Foundation, the Health Research Council, the Charitable Trust of the Auckland Faculty of the Royal New Zealand College of General Practitioners, the Research and Education Charitable Trust of the Royal New Zealand College of General Practitioners, the Ministry of Health Mental Health Directorate, the Institute of Rural Health, Hamilton and The University of Auckland Faculty Research Development Fund.

Many people have been integral to this body of work. I wish to give special thanks to my supervisors, Professor Bruce Arroll and Associate Professor Sunny Collings, for their valuable and complementary input which helped me shape this thesis. They attest the axiom "If you want something done, ask a busy person".

I would like to thank everyone who has contributed to this research including my many co-authors and collaborators (in alphabetical order): Bruce Arroll, Stephen Buetow, Nicole Coupe, Chris del Mar, Barbara Docherty, Raina Elley, Ngaire Kerse, Anne-Thea McGill, Chris Paton, Lana Perese, Fiona Rossen, Robin Shepherd, Sean Sullivan, Samson Tse, Mieke van Driel, Jim Warren and other contributors too numerous to name.

My sincere appreciation to all the many participants, including patients, general practitioners and nurses, for their willingness to partake in various aspects of this study making it possible.

Lastly my deepest gratitude to John and Judith for your love and support, to my dear friends Susanne and Grant, and to my mother Marie, who inspired in me a love of learning.
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# ABBREVIATIONS

This section provides a list of the abbreviations and acronyms used in this thesis.

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<td>AA</td>
<td>Alcoholics Anonymous</td>
</tr>
<tr>
<td>AAS</td>
<td>Abuse Assessment Screen</td>
</tr>
<tr>
<td>Absolute SnNout</td>
<td>Sensitivity so high that Negative result rules-out the diagnosis</td>
</tr>
<tr>
<td>Absolute SpPin</td>
<td>Specificity is so high that Positive result rules-in the diagnosis</td>
</tr>
<tr>
<td>ACLS</td>
<td>Physical Activity Questionnaire - Aerobics Center Longitudinal Study</td>
</tr>
<tr>
<td>ADM</td>
<td>Alcohol, drug and mental problems</td>
</tr>
<tr>
<td>AHRQ</td>
<td>Agency for Healthcare Research and Quality</td>
</tr>
<tr>
<td>AHS</td>
<td>Auckland Heart Study</td>
</tr>
<tr>
<td>API</td>
<td>Application Programming Interface</td>
</tr>
<tr>
<td>ARI</td>
<td>Abuse Risk Inventory</td>
</tr>
<tr>
<td>ASSIST</td>
<td>Alcohol, Smoking and Substance Involvement Screening Test</td>
</tr>
<tr>
<td>AUDIT</td>
<td>Alcohol Use Disorders Identification Test</td>
</tr>
<tr>
<td>BFSPC</td>
<td>Beck Fast Scan for Primary Care</td>
</tr>
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<td>BPAC</td>
<td>Best Practice Advocacy Centre</td>
</tr>
<tr>
<td>CAS</td>
<td>Composite Abuse Scale</td>
</tr>
<tr>
<td>CBT</td>
<td>Cognitive Behavioural Therapy</td>
</tr>
<tr>
<td>CCM</td>
<td>Chronic Care Model OR Consultation Care Measure</td>
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<td>CCMS</td>
<td>Collaborative Care Management Solution</td>
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<td>CDR</td>
<td>Clinical Decision Rule</td>
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<tr>
<td>CHAT</td>
<td>Case-finding and Help Assessment Tool</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence interval</td>
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<tr>
<td>CIDI</td>
<td>Composite International Diagnostic Interview</td>
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<tr>
<td>CIDI-SAM</td>
<td>Composite International Diagnostic Interview Substance Abuse Module</td>
</tr>
<tr>
<td>CTS</td>
<td>Conflict Tactic Scale</td>
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<tr>
<td>DAST</td>
<td>Drug Abuse Screening Test</td>
</tr>
<tr>
<td>DHB</td>
<td>District Health Board</td>
</tr>
<tr>
<td>DSM-IV</td>
<td>Diagnostic and Statistical Manual of Mental Disorders 4th edition</td>
</tr>
<tr>
<td>DV</td>
<td>Domestic violence</td>
</tr>
<tr>
<td>eCHAT</td>
<td>Electronic version of the Case-finding and Help Assessment Tool</td>
</tr>
<tr>
<td>EMR</td>
<td>Electronic medical record</td>
</tr>
<tr>
<td>ESP</td>
<td>Eating Disorder Screen for Primary Care</td>
</tr>
<tr>
<td>4DSQ</td>
<td>Four-Dimensional Symptom Questionnaire</td>
</tr>
<tr>
<td>FTND</td>
<td>Fagerström Test for Nicotine Dependence</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>FTQ</td>
<td>Fagerström Tolerance Questionnaire</td>
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<td>FVP</td>
<td>Family Violence Project</td>
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<td>GAD-7</td>
<td>Generalised Anxiety Disorder Assessment</td>
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<td>GAIR</td>
<td>GP Assessment and Intervention Record</td>
</tr>
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<td>GHQ</td>
<td>General Health Questionnaire</td>
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<tr>
<td>GP</td>
<td>General practitioner</td>
</tr>
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<td>GRx</td>
<td>Green Prescription</td>
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<td>Green Script Study</td>
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<td>HADS</td>
<td>Hospital Anxiety and Depression Scale</td>
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<td>HISO</td>
<td>Health Information Standards Organisation</td>
</tr>
<tr>
<td>HITS</td>
<td>Hurts, Insults, Threatens, Screams</td>
</tr>
<tr>
<td>HRQOL</td>
<td>Health-Related Quality Of Life</td>
</tr>
<tr>
<td>HSI</td>
<td>Heavy Smoking Index</td>
</tr>
<tr>
<td>ICD-10</td>
<td>International Statistical Classification of Diseases and Related Health Problems 10th Revision</td>
</tr>
<tr>
<td>IPA</td>
<td>Independent Practitioners Association</td>
</tr>
<tr>
<td>IPV</td>
<td>Interpersonal violence OR Intimate Partner Violence</td>
</tr>
<tr>
<td>ISA</td>
<td>Index of Spouse Abuse</td>
</tr>
<tr>
<td>IT</td>
<td>Information technology</td>
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<tr>
<td>JAMA</td>
<td>Journal of the American Medical Association</td>
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<tr>
<td>LR</td>
<td>Likelihood ratio</td>
</tr>
<tr>
<td>MaGPIe</td>
<td>Mental Health and General Practice Investigation</td>
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<tr>
<td>MAST</td>
<td>Michigan Alcohol Screening Test</td>
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<tr>
<td>MIST</td>
<td>Multi-Item Screening Tool</td>
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<tr>
<td>MOH</td>
<td>Ministry of Health</td>
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<tr>
<td>MWA</td>
<td>Measure of Wife Abuse</td>
</tr>
<tr>
<td>NA</td>
<td>Narcotics Anonymous</td>
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<tr>
<td>NHI</td>
<td>National Health Index</td>
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<td>NIDA</td>
<td>National Institute on Drug Abuse</td>
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<tr>
<td>NIHI</td>
<td>National Institute for Health Innovation</td>
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<tr>
<td>NNT</td>
<td>Numbers needed to treat</td>
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<tr>
<td>NZ</td>
<td>New Zealand</td>
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<tr>
<td>OR</td>
<td>Odds ratio</td>
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<tr>
<td>OSH</td>
<td>Occupational Health and Safety</td>
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<tr>
<td>PAS</td>
<td>Patient Assessment System</td>
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<td>PCMH</td>
<td>Patient-Centered Medical Home</td>
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<td>PHCS</td>
<td>Primary Health Care Strategy</td>
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<td>PHO</td>
<td>Primary Health Organisation</td>
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<td>PHQ-9</td>
<td>Patient Health Questionnaire – Depression</td>
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<td>PHQ-ED</td>
<td>Patient Health Questionnaire – Eating Disorder</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>PIS</td>
<td>Participant Information Sheet</td>
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<tr>
<td>PMHI</td>
<td>Primary Mental Health Initiative</td>
</tr>
<tr>
<td>PMS</td>
<td>Practice Management System</td>
</tr>
<tr>
<td>PMWI</td>
<td>Psychological Maltreatment of Women Inventory</td>
</tr>
<tr>
<td>PN</td>
<td>Practice nurse</td>
</tr>
<tr>
<td>PPCC</td>
<td>Patient Perception of Patient-Centeredness</td>
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<tr>
<td>PRIME-MD</td>
<td>Primary Care Evaluation of Mental Disorders</td>
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<td>PTSD</td>
<td>Post-traumatic Stress Disorder</td>
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<td>PVS</td>
<td>Partner Violence Screen</td>
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<tr>
<td>QOF</td>
<td>Quality and Outcomes Framework</td>
</tr>
<tr>
<td>RA</td>
<td>Research assistant</td>
</tr>
<tr>
<td>RCGP</td>
<td>Royal College of General Practitioners</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised controlled trial</td>
</tr>
<tr>
<td>RS</td>
<td>Reference standard</td>
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<tr>
<td>SCAN</td>
<td>Schedules for Clinical Assessment in Neuropsychiatry</td>
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<td>SF-12</td>
<td>Standard Form 12 items version</td>
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<tr>
<td>SNRI</td>
<td>Serotonin–Norepinephrine Reuptake Inhibitor</td>
</tr>
<tr>
<td>SOGS</td>
<td>South Oaks Gambling Screen</td>
</tr>
<tr>
<td>SR</td>
<td>Systematic review</td>
</tr>
<tr>
<td>SSRI</td>
<td>Serotonin Reuptake Inhibitor</td>
</tr>
<tr>
<td>STARD</td>
<td>Standards for Reporting of Diagnostic Accuracy</td>
</tr>
<tr>
<td>TCA</td>
<td>Tricyclic antidepressant</td>
</tr>
<tr>
<td>TICS</td>
<td>Two-Item Conjoint Screen</td>
</tr>
<tr>
<td>TQWHQ</td>
<td>Two Questions With Help Question</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>US</td>
<td>United States</td>
</tr>
<tr>
<td>USPTF</td>
<td>United States Preventive Task Force</td>
</tr>
<tr>
<td>WAST</td>
<td>Woman Abuse Screening Tool</td>
</tr>
<tr>
<td>WEB</td>
<td>Women’s Experience with Battering Scale</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
This section provides an outline of the key concepts used in this thesis. These are the definitions used within the context of this study.

General practice and primary health care

**General practice**  Medical practice which provides first-contact, comprehensive, continuing and coordinated care for all individuals, families and communities with integration of biomedical, psychological and social aspects of health.

**Primary care**  Locally based, affordable and accessible well-integrated health care services delivered by multi-disciplinary teams to people in the community. Services range from health promotion and preventive care to illness treatment and rehabilitation as well as extending into the domains of educational, justice, community and social services.

**Primary health care**  The system of primary care applied on a population level.

Screening and case-finding

**Screening**  Testing an asymptomatic population for the presence of a condition which if identified can lead to early intervention reducing subsequent morbidity or mortality. Mass screening is usually conducted by inviting the target population to attend for testing.

**Case-finding**  Seeking early detection of a condition when a patient attends for an unrelated concurrent disorder. For a specific condition the condition tested for will depend on a number of criteria including the age and gender of the patient and the presence of any risk factors which might increase their likelihood of being a positive case.
Validity

A test is valid if it measures what it is purported to measure. The following definitions apply the context of validation of a multi-item questionnaire.

**Face validity**
Confirmation from a group of experts as to whether this appears to be a reasonable measure of the concept as they understand it.

**Content validity**
Checks whether all the items that should be included are included and identifies the relevance of each indicator and criterion. Might be attained through asking experts whether the measure appears to contain all the important concepts, behaviours and elements of the concept, or more formally assessed by observing patients to see behaviours; interview them or review records; or base the instrument on previously reported measures.

**Construct validity**
The extent to which the items are as closely associated as expected, according to theory. If an item is related as predicted, it has construct validity. It invokes a theoretical construct that describes the relationship between the attribute under study and other attributes. If the relationship of these two attributes is shown to be in the expected direction, there is evidence that both the measure and the hypothetical construct were right. However if there is no relationship between the two measures there is no way to determine whether the measure or the theory was wrong.

**Criterion-related validity**
The ability of each criterion to measure accurately a specific concept or condition. To assess this ability, the criterion is compared with a ‘gold’ or reference standard. This is the strongest form of validity.

**Measures of the occurrence of a condition**

**Incidence**
The incidence of a condition is the rate at which new cases occur in a population during a specified period.

**Prevalence**
The prevalence of a condition is the proportion of a population who actually have a condition at a given point in time. Prevalence depends on both the incidence (the rate of new problem during a period of time) and the duration of the problem.

**Measures of test accuracy**
The accuracy of a test is the degree of closeness of the measurement to the true value of what is being measured. The accuracy of a screening test can be measured against a reference

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standard that confirms a person has a condition.

<table>
<thead>
<tr>
<th>Has condition</th>
<th>Does not have condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Reference test positive)</td>
<td>(Reference test negative)</td>
</tr>
<tr>
<td>Positive screening test</td>
<td>True positive</td>
</tr>
<tr>
<td>Negative screening test</td>
<td>False negative</td>
</tr>
</tbody>
</table>

The accuracy of a screening or diagnostic test can be expressed through several different measures: sensitivity and specificity, positive and negative predictive values, or positive and negative diagnostic likelihood ratios. In the following table true and false positive, false and true negative are represented by A, B, C and D respectively.

<table>
<thead>
<tr>
<th>Has condition</th>
<th>Does not have condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive test</td>
<td>A</td>
</tr>
<tr>
<td>Negative test</td>
<td>C</td>
</tr>
</tbody>
</table>

**Gold or reference standard**

An external variable (criterion) that has been demonstrated to be a valid measure of the specific condition.

**Sensitivity**
The ability of the test to detect the condition or disease (true positive rate). Sensitivity is the number of people with the disease who have a positive test divided by the number with the disease (ie if all those with the disease were detected, the sensitivity would be 100%). Sensitivity = A/ (A+C).

**Specificity**
The ability of the test to correctly identify people who do not have the condition or disease (true negative rate). Specificity is the number of people without the disease who have a negative test divided by the number of people without the disease (ie if all the people without the disease were identified as testing negative, the specificity would be 100%). Specificity = D/(B+D).

**Likelihood ratio**
The likelihood ratio (LR) incorporates both the sensitivity and specificity of the test and provides a direct estimate of how much a test result will change the odds of having a disease.

**Likelihood ratio for a positive result**
The likelihood ratio for a positive result (LR+) tells you how much the odds of the disease increase when a test is positive.
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Likelihood ratio for a negative result</strong></td>
<td>The likelihood ratio for a negative result (LR-) tells you how much the odds of the disease decrease when a test is negative.</td>
</tr>
<tr>
<td><strong>False positive rate</strong></td>
<td>Rate of people testing positive who have no disease. The false positive rate is the number of people with a positive test who do not have the disease divided by the number of all people without disease = B/(B+D).</td>
</tr>
<tr>
<td><strong>False negative rate</strong></td>
<td>Rate of people who have the disease but test negative. The false positive rate is the number of people with a negative test who have the disease divided by the number of all people with disease = C/(A+C).</td>
</tr>
<tr>
<td><strong>Positive predictive value</strong></td>
<td>The number of people with a positive test who have the disease divided by the number of all the people with a positive test = A/(A+B).</td>
</tr>
<tr>
<td><strong>Negative predictive value</strong></td>
<td>The number of people with a negative test who do not have the disease divided by the number of all the people with a negative test = D/(C+D).</td>
</tr>
<tr>
<td><strong>Confidence interval</strong></td>
<td>The confidence interval (CI) reflects the statistical significance of each accuracy measure. A confidence interval estimate of a parameter consists of an interval of numbers obtained from a point estimate of the parameter and a percentage that specifies how confident we are that the interval contains the true value of the parameter. This percentage is called the confidence coefficient. For example, a 95% CI is a range of values with which we are 95% sure that the quantity of interest falls. That is if new samples were taken repeatedly and a confidence interval were constructed for them using the same procedure, then 95% of them would contain the true value.</td>
</tr>
<tr>
<td><strong>Pre-test probability</strong></td>
<td>This is the probability that a person has the target condition before a diagnostic test result is known.</td>
</tr>
<tr>
<td><strong>Post-test probability</strong></td>
<td>The post-test probability represents the chances that the person has the condition. It combines information about the prevalence of the condition, the patient population, specific patient risk factors (their pre-test probability) and information about the diagnostic test (the likelihood ratio). The pretest odds of a particular diagnosis, multiplied by the likelihood ratio, determines the post-test odds.</td>
</tr>
</tbody>
</table>
Measures of reliability

Reliability relates to the consistency of a measure - the extent to which a measure is reproducible, or gives the same results, over different situations (for example, by different people or on different days).

**Test-retest reliability**
A measure of the degree to which the same result is obtained when a test is repeated by the same person or same instrument on the same item under the same conditions.

**Inter-rater reliability**
A measure of the degree of agreement among raters when a measurement is made by a different person but with the same instrument or using the same method.

**Internal consistency reliability**
A measure of the consistency of results across items within a test.

**Bias**
For the purpose of this thesis, bias refers to the human tendency to make systematic errors based on beliefs or values rather than quantitative evidence.
Levels of evidence for diagnostic tests

Levels of evidence are a ranking of the validity of evidence, first developed in 1979\(^2\) and revised by the Oxford Centre for Evidence-based Medicine over time.\(^3\)

<table>
<thead>
<tr>
<th>Level</th>
<th>For diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>SR (with homogeneity) of Level 1 diagnostic studies; CDR(^*) with 1b studies from different clinical centres</td>
</tr>
<tr>
<td>1b</td>
<td>Validating(^**) cohort study with good(^<em>) reference standards; or CDR(^</em>) tested within one clinical centre</td>
</tr>
<tr>
<td>1c</td>
<td>Absolute SpPlins and Absolute SnNouts(^*)</td>
</tr>
<tr>
<td>2a</td>
<td>SR (with homogeneity(^*)) of Level &gt;2 diagnostic studies</td>
</tr>
<tr>
<td>2b</td>
<td>Exploratory(^**) cohort study with good(^<em>) reference standards; CDR(^</em>) after derivation, or validated only on split-sample(^§§§) or databases</td>
</tr>
<tr>
<td>3a</td>
<td>SR (with homogeneity(^*)) of 3b and better studies</td>
</tr>
<tr>
<td>3b</td>
<td>Non-consecutive study; or without consistently applied reference standards</td>
</tr>
<tr>
<td>4</td>
<td>Case-control study, poor or non-independent reference standard</td>
</tr>
</tbody>
</table>
| 5     | Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"

\(^*\) By homogeneity we mean a systematic review (SR) that is free of worrisome variations (heterogeneity) in the directions and degrees of results between individual studies. Not all systematic reviews with statistically significant heterogeneity need be worrisome, and not all worrisome heterogeneity need be statistically significant. As noted above, studies displaying worrisome heterogeneity should be tagged with a "\(^-\)" at the end of their designated level.

\(^**\) Validating studies test the quality of a specific diagnostic test, based on prior evidence. An exploratory study collects information and trawls the data (e.g. using a regression analysis) to find which factors are 'significant'.

\(^*\) Clinical Decision Rule (Algorithms or scoring systems that lead to a prognostic estimation or a diagnostic category)

\(^\"\) An "Absolute SpPin" is a diagnostic finding whose Specificity is so high that a Positive result rules-in the diagnosis. An "Absolute SnNout" is a diagnostic finding whose Sensitivity is so high that a Negative result rules-out the diagnosis.

\(^\"\)\(^\"\) Good reference standards are independent of the test, and applied blindly or objectively to applied to all patients. Poor reference standards are haphazardly applied, but still independent of the test. Use of a non-independent reference standard (where the 'test' is included in the 'reference', or where the 'testing' affects the 'reference') implies a level 4 study.

\(^§§§\) Split-sample validation is achieved by collecting all the information in a single tranche, then artificially dividing this into "derivation" and "validation" samples.

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\(^2\) Canadian Task Force on the Periodic Health Examination: The periodic health examination. CMAJ 1979;121:1193-1254


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CHAPTER 1. INTRODUCTION

1.1 History of this body of research

This thesis covers a body of work that I undertook between 2001 and 2011. It describes the development, evaluation, validation and application of a case-finding and help assessment tool (CHAT) to identify risky lifestyle behaviours and mental health issues in adults (16 years and over). It incorporates a number of papers published in peer-reviewed journals with myself as principal or co-author. 1-12

The increasing focus on preventive practice in primary care settings necessitates identifying lifestyle and mental health risk factors for early intervention. Important risky behaviours which can influence health and well-being include misuse of tobacco, alcohol, recreational drugs and gambling and physical inactivity. Mental health risk factors include anxiety, depression, difficulty controlling anger and being hurt, threatened or controlled by another person.

Validated screening tools are available. 13-25 Opportunistic screening is likely to have limited effect compared with routine screening by invitation. 26 However, given consultation time restraints, compliance with routine screening regimes can be low for both patients and practitioners. 27,28 Furthermore, some patients are embarrassed or object to being asked sensitive questions about their lives. An example is the lack of acceptance of domestic violence screening among women, with objection rates ranging from 15 to 57%. 29-40

This work was undertaken in the context of the publication of a guideline by the New Zealand (NZ) Ministry of Health (MOH) in 2002 on screening for domestic violence in primary care settings. This recommended that all female patients aged over 15 years seen in general practice should be routinely screened annually about physical and sexual abuse by their partners. 41 Women should be questioned annually about physical or sexual abuse that may have occurred over the past year (“unless circumstances suggest more frequent questioning is warranted”). I assessed these guidelines in the context of accepted criteria for mass screening programmes, resulting in several published papers which are outlined in this thesis in Section 2.4.7.1,2,4

Both Bruce Arroll and I had been independently exploring the concept a brief multi-item screening tool for some time. We recognised that addictive behaviours such as smoking, problematic drinking, drug use and gambling, mental health issues such as anxiety and
depression, along with poor eating and sedentary behaviours, frequently co-exist and can be either causal or consequential of each other (for example, someone may be depressed, not exercising and using alcohol to excess). Furthermore I had identified that being subject to abusive behaviour by another person (being threatened, hurt or controlled) and being frustrated and angry with lack of strategies for anger control, also co-exists with many of these other life domains. A review of the literature confirmed that such a tool had not been developed. We predicted that self-reporting on a number of different domains of life would increase patient acceptability, because patients would not feel singled out about a specific problem.

To increase the patient-centredness of the tool, assessing whether identified issues were those that patients want to address, and to reduce the burden on the practitioner of providing multiple interventions, I proposed to ask for each problem whether these were issues with which the patient wanted help.

I had an existing research interest in screening and community intervention for interpersonal violence and I wanted to test whether embedding generic questions about abuse in a brief tool addressing other lifestyle and mental health issues would be more acceptable to patients than specific screening for inter-partner violence. Because this was my original focus, this thesis concentrates on issues around screening or case-finding for inter-personal violence.

While that CHAT was initially developed as a paper tool, general practitioners record clinical information in electronic medical records, and the intention was always to have the product delivered electronically (the eCHAT).

1.2 Hypotheses

1. That a brief multi-item tool, either self or practitioner-administered, for identifying lifestyle problems and mental health issues will be acceptable to and valued by primary care and other community workers and their patients or clients.

2. That generic questions about abuse and anger control embedded within a multi-tiem tool will be more acceptable to patients than specific screening questions for inter-partner violence asked in isolation.

3. That such a tool will have good validity against a composite reference standard.

4. That asking whether people want help with issues that they have indicated will identify those who both need and want intervention.
1.3 Aims of the study

1. To describe the literature for evidence for or against identifying specific risky lifestyle behaviours and mental health issues in community settings.

2. To describe the development of a brief multi-item tool to identify risky lifestyle behaviours and mental health issues in primary care and community settings that is acceptable to those completing the tool and to practitioners who might administer or receive and act on the findings.

3. To embed generic questions on abuse and anger control within a multi-item tool in a manner that is acceptable to patients.

4. To report the measurement of the validity of the tool.


6. To describe the development and feasibility of implementing an electronic version of the tool, the eCHAT.

1.4 Overall structure of this thesis

The overall structure of this thesis is shown in Figure 1.1. In Chapter 2 I examine the evidence to support case-finding for various life domains and in Chapter 3 I explore the subjective component in even the highest form of evidence, meta-analysis.

Chapter 4 is a literature review of the single and multiple domain screening tools available at the onset of developing the Case-Finding and Help Assessment Tool (CHAT) looking at the settings in which these were developed, their reliability and validity.

Chapter 5 reports on the development of the CHAT and Chapter 6 on studies on the acceptability of the CHAT and evaluation in different contexts and settings.

Chapters 7 and 8 report research validating the CHAT and validating the Help question respectively. CHAT 9 discusses the development of the electronic form of the tool, the eCHAT and ways in which the tool has been used to date.

Finally Chapters 10 and 11 present the discussion and conclusions, summarising the overall findings, how these compare and contrast with what is already known, the strengths and the limitations of this body of work and its relevance for future practice, policy and research.
Figure 1.1 Overall Structure of this Thesis
The research presented in this thesis was conducted between 2001 and 2011. Figure 1.2 presents the overall timeline for the components of this work.

Figure 1.2 Timeline of Research Discussed in this Thesis

1.5 Summary of Chapter 1

In this Chapter I have explained the rationale for the development of the CHAT.

Dealing with risky lifestyle behaviours and mental health issues is a core component of general practice and primary care. These factors have considerable impact on health and well-being, therefore early detection and intervention are likely to result in substantial long-term health gains. However primary care practitioners have time constraints in systematically exploring these issues when patients consult for other reasons. Furthermore patients might feel disquiet about being asked about a particular “bad” behaviour in isolation. Combining a number of life domains would have the effect of embedding a specific risky lifestyle issue, which we
hypothesised would increase the acceptability of the questioning because one issue was not singled out as being the patient’s particular problem. Also by including a number of different domains, such as issues around gambling behaviour, would indicate that dealing with these falls within the realm of general practice, and are concerns that patients may legitimately raise with their primary health provider for assistance.

Review of the literature indicated that there was no multi-item tool available to detect these issues in primary care. We aimed to develop a tool that could be employed either pre-consultation (for example self-administered in the waiting room) or completed together by the patient and practitioner (general practitioner or practice nurse) efficiently during a consultation. In order to increase the patient-centredness of the tool, as well as decrease the potential added burden on the clinician of positive responses needing attention, I proposed the additional question of whether the patient wanted help, either during this consultation or at a later date, with each particular life domain. Where patients had multiple concerns, this would help them prioritise the area they wished to initially address.
CHAPTER 2. NEED FOR A MULTI-ITEM SCREENING OR CASE-FINDING TOOL

2.1 Outline of Chapter 2

The first aim of this thesis is to assess the literature for evidence for or against identifying specific risky lifestyle behaviours and mental health issues in community settings. In this chapter I address the rationale for developing a composite case-finding tool for risky lifestyle behaviours and mental health issues, the recognised criteria for screening, differentiating between screening and case-finding, and the justification for screening or case-finding for specific lifestyle behaviours and mental health issues. The case for and against screening for domestic violence is explored in depth, serving as an exemplar.

[Diagram showing outline of Chapter 2]

Figure 2.1 Outline of Chapter 2 - Assessing the Need for the CHAT

2.2 Background: Rationale for a composite tool

2.2.1 Co-existence of risky behaviours and mental health issues

Increasing focus on preventive practice in primary care settings necessitates identifying lifestyle and mental health risk factors for early intervention. Patients with medical conditions who have
psychological comorbidity have significantly increased utilisation of health services, even after adjustment for severity of disease. The majority of patients presenting in primary care will have psychological components. Addressing risky behaviours such as substance use and physical inactivity have the potential for primary and secondary prevention of chronic illness. Smoking cessation is one of the most important interventions for prevention of chronic cardiovascular and respiratory diseases.

Important risky behaviours which can influence health and well-being include misuse of tobacco, alcohol, recreational drugs and gambling and physical inactivity. Mental health issues include anxiety, depression, difficulty controlling anger and being hurt, threatened or controlled by another person. Lifestyle issues, mental health and chronic disease are all inter-related. People with co-morbidities are more likely to be anxious and / or depressed, and these relationships may be bi-directional. Depressed people are less likely to exercise. Furthermore, there is some evidence that exercise is effective as an intervention for depression.

It is widely accepted within the professional literature worldwide that mental health problems are experienced by significant proportion of patients accessing general practice services. In NZ, the prevalence estimates vary on primary mental health problems varies. According to the 1997 New Zealand National Mental Health Plan, the data on the prevalence of mental health issues in the adult population of NZ indicated that about 3% experience severe mental illness, 5% have moderate to severe illness and 12% have mild to moderate illness. It is the 17% of New Zealanders who experience a mental health problem outside the realm of severe mental illness that are most relevant to primary care. The subsequent NZ mental health survey Te Rau Hinengaro, with a sample size of almost 13,000 adults, found that 20.7% met the criteria for having a mental disorder in the previous 12 months. A NZ study known as the MaGPlE (Mental health And General Practice Investigation) reported that a third of general practice patients had experienced a DSM-IV diagnosable illness. Additionally, the general practitioners (GPs) believed that about half of their patients had a recognisable psychopathology. These data are consistent with international evidence documented in a World Health Organization (WHO) study which concluded that 24% of primary care patients have an ICD-10 recognised mental health problem and that 9% of patients have a subthreshold syndrome. Despite the prevalence of mental disorders presenting in primary care settings, the WHO argues that many mental health issues go undiagnosed and estimates that less than a third of those who need treatment receive it. Within primary care, patients most commonly present with distress or a mixture of depressed and anxious symptoms not meeting established diagnostic criteria. While referral to mental health services may not be appropriate, early intervention can be provided in general practice if these patients are identified. The NZ MaGPlE study found that GPs may still treat when there is no explicit diagnosis or only subthreshold symptoms, although they are more likely to offer psychological
rather than pharmacological interventions. In general practice making the diagnosis may be less important than providing relief from distress. There is some evidence that ultra-brief interventions by GPs will improve the psychological wellbeing of ‘subthreshold’ patients.

Mental illness is a significant cause of disability in NZ and represents a sizable percentage of the total personal health services funding. According to the review of opportunities for primary mental health interventions outlined by the Ministry of Health (MOH) in 2002, the costs to society from undiagnosed and untreated mental illness are significant. While specific data for NZ has not been quantified, international evidence points to societal burdens that include:

- Repeated GP consultations
- Sickness/absence from employment
- Labour turnover
- Reduced productivity
- The impact on family and children.

The MaGPIe study found that GPs were more likely to identify subthreshold cases in patients who had concomitant disability than those without other conditions but suffering from distress.

Increasing emphasis on preventive practice in primary care settings necessitates intervening for lifestyle and mental health risk factors. General practice offers first-contact care to patients requiring help with problem behaviours, and many patients expect to receive preventive lifestyle assistance from their GP. Eighty percent of the NZ population consult with their GP at least once a year. Opportunistic screening within general practice is likely to have limited effect compared with routine screening. However, given consultation time constraints, compliance with routine screening regimes can be low for both patients and practitioners.

2.2.2 Priority population health objectives

The NZ Health Strategy specified thirteen priority population health objectives for implementation in the short to medium term. These were:

- Reduce smoking
- Improve nutrition
- Reduce obesity
- Increase the level of physical activity
- Reduce the rate of suicides and suicide attempts
- Minimise harm caused by alcohol and illicit and other drug use to both individuals and the community
- Reduce the incidence and impact of cancer
- Reduce the incidence and impact of cardiovascular disease
- Reduce the incidence and impact of diabetes
• Improve oral health
• Reduce violence in interpersonal relationships, families, schools and communities
• Improve the health status of people with severe mental illness
• Ensure access to appropriate child health care services including well child and family health care and immunisation.

The tool first developed in 2001, known as the Multi-item Screening Tool or MIST,\(^8\) now known as the Case-finding and Help Assessment Tool or CHAT,\(^10\) was designed to help GPs to address these objectives either directly or indirectly. Six were addressed directly, namely: reducing smoking, increasing the level of physical activity, reducing the rate of suicides and suicide attempts, minimising the harm caused by alcohol and illicit and other drug use to individuals and the community, improving the health status of people with severe mental illness and reducing violence in interpersonal relationships, families, schools and communities. Indirectly, screening and intervening with respect to smoking, alcohol misuse, physical inactivity and eating disorders also contribute to the other objectives of improving nutrition, increasing physical fitness, reducing obesity, reducing the incidence and impact of cancer, reducing the incidence and impact of cardiovascular disease and reducing the incidence and impact of diabetes. Attending to diet and discussing healthy living choices with families also indirectly addresses issues related to oral health and well child and family care.

### 2.2.3 Value of embedding questions

Some patients are embarrassed or object to being asked sensitive questions about their lives. For example, studies examining women’s acceptance of domestic violence screening show huge variability in the percentage who object – ranging from 15 to 57%.\(^{29-40}\) Similarly, most studies indicate that the majority of GPs and other primary care workers are not in favour of routine mass screening for partner abuse.\(^{33,66-69}\)

We anticipated that embedding questions on sensitive health behaviours (such as illicit drug use, alcohol abuse, being exposed to abusive behaviour or having difficulty with anger control) within a broader context of questions addressing healthy lifestyles and wellness would decrease patients’ objections to being asked about these issues. Furthermore this would facilitate addressing co-existing risky health behaviours and negative moods. Previous literature has indicated that threatening questions are experienced as less intrusive when embedded in questionnaires.\(^{70}\)

It has been argued that preventive medicine actioned by doctors asking about lifestyle risk factors might undermine patient autonomy.\(^{71}\) The MIST / CHAT aimed to address this criticism by being self-administered by the patient (who may chose not to complete it) and asking
whether an item identified as an issue is something with which the patient would like help, either immediately or at a later date.

2.3 Screening criteria

The WHO criteria\(^\text{72}\) and the Journal of the American Medical Association (JAMA) evidence-based medicine working group recommendations\(^\text{73}\) outline factors to be considered regarding whether screening is justified, and include the following considerations:

- Is it an important health problem?
- Is a clear diagnosis available?
- Does a suitable test exist?
- Is the test acceptable to the population?
- What are the benefits?
- What are the harms?
- Complications arising from investigation
- False negatives
- False positives
- Adverse effects of labelling or early diagnosis
- Unnecessary treatment of persons with true-positive test results who may have inconsequential disease.
- How do benefits and harms compare in different people?
- Is there evidence that early intervention works (ideally a randomised controlled trial)?
- Is screening cost-effective?

The US Preventive Services Task Force (\(\text{http://www.ahcpr.gov/clinic/uspsfix.htm}\)) also gives directives regarding screening on the basis of scientific effectiveness.\(^\text{74}\) Two criteria should be met: there must be an accurate test for the condition and there must be scientific evidence that screening can prevent adverse outcomes. The test must be able to detect the target condition earlier than without screening and with sufficient accuracy to avoid producing large numbers of false-positive and false-negative results. Screening for, and treating persons with, early disease should improve the likelihood of favourable health outcomes (for example, disease-specific morbidity or mortality) compared with treating patients when they present with signs or symptoms of disease. Ultimately a randomised controlled trial (RCT) needs to be performed to verify this claim.

2.4 Case-finding versus screening

Screening and case-finding are terms sometimes used synonymously.\(^\text{75}\) However while both involve the early detection of a condition, in the context of this thesis, screening refers to testing
an asymptomatic population for the presence of a condition which if identified can lead to early intervention reducing subsequent morbidity or mortality. Mass screening is usually conducted by inviting the target population (ideally asymptomatic) to attend for testing. Case-finding involves seeking early detection of a condition when a patient attends for an unrelated concurrent disorder and may or may not be symptomatic. For a specific condition testing will depend on a number of criteria including the age and gender of the patient and the presence of any risk factors which might increase their likelihood of being a positive case ie increase the pre-test probability. Screening and case-finding will differ with respect to their setting and the expectations of their populations. 

Because the MIST / CHAT is designed to be used systematically in primary care for patients perceived to be at risk rather than used for mass population screening, I decided that case-finding is a more appropriate term than screening.

2.5 Justification for screening or case-finding for specific lifestyle behaviours or mental health issues

A systematic examination of the literature identified the criteria for and against screening or case-finding in primary care for these various life domains. The search strategy involved use of the key words ‘Mass screening’ OR ‘Screening’ OR ‘Case-finding’ AND relevant synonyms for each of the domains (for example AND ‘Smoking’ OR ‘Tobacco’ OR ‘Cigarettes’) using the following databases: Cochrane Database of Systematic Reviews (CDSR), Medline 1966 to May 2002, Embase 1980 to May 2002 and CINAHL 1982 to May 2002. Additional studies were identified by hand searching the reference lists of retrieved papers and examination of grey literature such as guidelines.

2.5.1 Smoking (tobacco use)

The serious health effect of tobacco use cannot be disputed (ie it is an important health problem), and suitable tests are available. Self-report measures of tobacco dependence include the 8-question Fagerström Tolerance Questionnaire (FTQ), the 6-question Fagerström Test for Nicotine Dependence (FTND) and the two-question Heavy Smoking Index (HSI).

There are successful interventions which assist in smoking cessation, and evidence that smoking cessation can positively impact on health outcomes (early intervention improves health). There is good evidence [1a] (see Glossary Levels of Evidence) to support smoking cessation counselling by physicians for all patients who smoke, including brief motivational interviewing. Other effective interventions include non-tailored smoking cessation letters, nicotine replacement therapy, which increases quit rates approximately 1.5 to 2-fold regardless of setting, and use of other drugs including bupropion, nortriptyline, and varenicline.
Smoking cessation has also been demonstrated to be cost-effective.82

It is generally accepted that adult patients should be screened for smoking in the primary health care setting (Canadian Task Force on Preventive Health Care, http://www.ctfphc.org/). Tobacco smoking therefore qualified for inclusion in the tool.

2.5.2 Drinking (alcohol misuse)

A number of studies indicate a high prevalence of harmful or problematic drinking83-86 and alcohol abuse and dependence87 in NZ. The health and social costs of alcohol abuse are considerable, including reduced working efficiency, premature death, increased health care costs, and increased costs to the police and justice systems.88 A study of a random sample of patients interviewed and breath tested in the Auckland Hospital emergency department found that 35% of injured patients reported consuming alcohol before sustaining their injury.89 Problematic drinking is therefore an important health problem.

The Alcohol Use Disorders Identification Test (AUDIT),17 has been well validated and well researched for the identification of hazardous and harmful alcohol consumption. Using a cut off score of 8 out of a possible 40, the sensitivity and specificity of the AUDIT for identifying hazardous and harmful alcohol use are 92% and 93% respectively.18 The tool is particularly useful in detecting recent problem drinking. Its other strengths include its brevity, its development within the primary care setting, and its demonstrated freedom from gender and cultural biases.90

In previous work we had found that most NZ GPs believed in the importance of early detection and prevention of alcohol abuse, but spend little time with patients engaged in either activity, although most would like to.91 We had conducted a study that involved 67 Auckland GPs collecting a total of 15,013 completed AUDITs from consecutive adult patients in 1995, and then using the same GPs to repeat this exercise in 2003 (total of 7671 AUDITs).92 This demonstrated an alarming increase in risky and problem drinking in the 16 to 24 age group between 1995 and 2003. While the GPs reported the AUDIT as a useful tool, they generally considered it too long for regular use, and identified that having a “quick and easy screening questionnaire” would improve their ability to detect and intervene for problematic drinking.91

There are demonstrated effective treatments for harmful drinking, including brief interventions.93-95 For example, a randomised controlled trial found a brief intervention was effective in reducing drinking in patients with problem drinking, and this effect was sustained for up to 48 months.96 The WHO and the US Preventive Task force strongly advocate routine screening of adult patients for alcohol misuse.97,98
2.5.3 Non-prescription and recreational drug use

While many GPs screen for nicotine and alcohol use, they are much less likely to do so for recreational and other non-prescription drug use. The US Preventive Services Task Force recommends screening in primary care for alcohol disorders and depression, and it is often recommended that that there should be combined screening for alcohol, drug, and mental (ADM) problems in primary care.100

The two question screen “Do you ever feel the need to cut down on your drug use?” and “In the last year, have you ever used drugs more than you meant to?” has been shown to have a sensitivity and specificity of nearly 80% validated against the Composite International Diagnostic-Interview-Substance Abuse Module (CIDI-SAM), a series of questions based on the Diagnostic and Statistical Manual of Mental Disorders.101

2.5.4 Problem gambling

Problem gambling is an identified social problem which can impact negatively on health. A steady rise has occurred in the number of people seeking help from NZ problem gambling counselling services from 1997 to 2002 with particularly high presentation of Māori and Pacific clients.102 In his development of the ‘Eight’ gambling screening tool, Sullivan found a similar over-representation of Māori and Pacific people.103 Given that the NZ Māori and Pacific populations are disadvantaged and have poorer health outcomes than NZ European, a case therefore could be made for considering Māori and Pacific people as target groups for case-finding for problematic gambling to address inequity issues

A national telephone survey of over 4000 NZ adults to determine involvement in gambling activities (including use of the SOGS for pathological gambling) found 2.7% (+/- 0.5%) scored as probable pathological gamblers and a further 4.2% (+/- 0.6%) scored as problem gamblers.104

A number of studies have shown a strong relationship between pathological gambling and substance abuse in patients with psychiatric diagnoses.105-108 For example, one study found the rate of problem gambling among people with mental illness or substance abuse problems was about ten times the estimated rate for their general population.108 A strong case can therefore be made for case-finding for gambling in high risk primary care patients if not for mass screening.
2.5.5 Depression

Depression is a common mental health problem seen frequently in primary care settings. In a study led by Professor Bruce Arroll, with myself and GP Dr Trevor Lloyd as co-authors, GPs asked all consecutive patients over sixteen years attending for consultation who consented to complete a Beck Depression Inventory (BDI) administered by a research assistant. The GPs previously recorded whether they considered these patients depressed. The patient response rate was 81% (253/314). Using a threshold of > 16, the BDI found a 13.8% (35/253) 95% CI (9.6-18.5) depression prevalence among patients. GPs picked up 51% of cases (sensitivity 0.51 and specificity 0.91). In this study Māori patients were no more likely to be depressed than non-Māori but they were less likely to be receiving or have received treatment with antidepressants. However other studies have found increased rates of depression among Māori. Research conducted in general practice by the “MaGPIe” mental health and general practice investigation research group found that Māori had a much higher rate of depression in the last 12 months compared with non-Māori (46.4% compared with 18.4% respectively). The MaGPIe diagnosis was made using the Composite International Diagnostic Interview (CIDI) which may account for differences in the detected rates.

The 1991 to 1992 WaiMedCa study of general practice patients in the Waikato found that 4.4% of patients received a ‘psychological’ diagnosis. Subsequent studies have found the overall rate of depression in the past 12 months in primary care populations to be 9.4% in a cross-sectional Christchurch study, 13.8% in our Auckland study and 18.4% in the MaGPIe study. GPs see more depressed patients than other health professionals, therefore improvement in detection and management of depression in primary care is important.

The MaGPIe study also found high rates of patients who had not disclosed psychological problems to their GPs (their reasons including “unwillingness to discuss psychosocial problems with anyone at all, belief that a GP is not the appropriate person to talk to and concerns about aspects of their relationship with their own GP”). Disclosure was higher where there was a good therapeutic relationship. While the authors state that screening on its own is unlikely to improve the identification of these problems, it could be argued that screening tools that let the patient know that this is an area that the GP feels is relevant to health and is interested in exploring with the patient and hence may facilitate patient-doctor communication.

A more recent study we conducted, again led by Professor Bruce Arroll, also assessed the prevalence of major depression among Māori patients in Auckland general practice using the Composite International Diagnostic Interview (CIDI) and the Patient Health Questionnaire (PHQ) as measurement tools. Co-authors on the paper were myself, Professor Ngaire Kerse from the Department of General Practice & Primary Health Care, University of Auckland, Ms Melanie Hwang, Dr Susan Crengle, senior lecturer, Te Kupenga Hauora Māori, Professor Jane
Gunn, University of Melbourne, Australia, Dr Tana Fishman, GP academic, Department of General Practice & Primary Health Care, University of Auckland, Dr Simon Hatcher, academic psychiatrist, Department of Psychological Medicine, University of Auckland, Sanat Pradhan and Krishma Sidhu.

This prevalence study is part of a larger randomised trial. Consecutive patients were recruited from 77 GPs. All patients received a computerised CIDI examination and one third received a PHQ assessment prior to the CIDI. The interviewer was blind to the questionnaire results when the patient did the CIDI. From 7994 patients approached there were data on 7432. Māori were 9.7% of the study sample. The overall 12-month prevalence of major depression based on the CIDI was 10.1% 95%CI (8.8 to 11.4). For Māori the prevalence was 11.5% 95%CI (8.8 to 14.2) and for non-Māori 10.1% 95%CI (8.6 to 11.3). For Māori men and Māori women the prevalence was 8.5% and 13.4% respectively and for non-Māori men and non-Māori women it was 8.3% and 11.1%. The prevalence of depression over at least the previous two weeks of a PHQ-9 score of nine or greater for all participants was 12.9% 95%CI (11.2 to 14.5). This prevalence of depression among Māori is high, although not quite as high as in earlier research such as the MaGPIe study. These variations may be due to differences in study design – MaGPIe screened using the GHQ-12 and then conducted CIDI interviews at a later date, usually at the patient’s home.

We undertook a review on screening for depression in primary care settings and identified five systematic reviews (four with pooled data). There were three meta-analyses conducted by Gilbody and colleagues between 2001 and 2008, including one Cochrane review, and none of these favoured screening. There were two reviews (one meta-analysis) from another author group, the US Preventative Task Force (USPTF), in 2002 and 2009 which favoured screening provided that it is coupled with system changes to ensure adequate treatment and follow-up.

A descriptive study was undertaken to address the question of how meta-analyses with the same research question can have opposing recommendations. This is reported in Chapter 3.

Management of depression in primary care has been shown to be effective. Non-pharmaceutical interventions that may be successful include short-term psychodynamic psychotherapies, problem-solving treatment provided by GPs, mental health workers delivering psychological therapy and psychosocial interventions in primary care settings, telephone counselling and exercise programmes. Telephone monitoring has been shown to be particularly effective. Primary health nurse telehealth care (emotional support and focused behavioural interventions in ten 6-minute telephone calls during four months) produces a 57% response rate vs 38% for usual care, which is a numbers needed to treat (NNT) of six.
We decided that case-finding for depression is indicated as long as adequate management of any detected conditions is available.

I recently contributed to a Cochrane systematic review (authors Professor Bruce Arroll, Associate Professor C Raina Elley and Dr Tana Fishman and myself, Department of General Practice & Primary Health Care, University of Auckland, Tim Kenealy, GP and Associate Professor of Integrated Care, University of Auckland, Dr Grant Blashki, University of Melbourne, Australia, Professor Ngaire Kerse, Department of General Practice & Primary Health Care and Steve MacGillivray, Department of Epidemiology and Public Health, University of Dundee, UK) to determine the efficacy and tolerability of antidepressants in patients under the age of 65 years with depression in primary care. The review found that the numbers needed to treat (NNT) for tricyclic antidepressants (TCAs) ranged from 7 to 16 (median NNT 9) and for serotonin reuptake inhibitors (SSRIs) from 7 to 8 (median NNT 7). The review concluded that both TCAs and SSRIs are effective for depression treated in primary care. This further supports case-finding for depression in primary care.

2.5.6 Anxiety and stress

While the US Preventive Services Task Force and the Canadian Task force on preventive health care does not specifically advocate screening for anxiety and stress, the prevalence of these conditions is high within our communities and appears to be increasing. There is considerable overlap between the syndromes of depression and anxiety. The distinction between anxiety and depression has been identified as inadequate in a community population, where most disorders present as a combination of depression and anxiety, and a unitary classification of mood and anxiety disorders has been proposed.55

Both workplace stress and depression are reaching epidemic proportions.129 Stress, anxiety and depression are now second only to musculo-skeletal disorders as a cause of absence from work in the United Kingdom (UK).130 Health and safety legislation in the UK requires organisations to undertake risk assessments for psychosocial hazards in the workplace. The United States (US) National Institute for Occupational Safety and Health reports stress-related disorders are a rapidly increasing reason for worker disability.131

‘Stress’ is an integral part of the human condition and stressors can be physical, mental or emotional. The ‘stress response’ is a normal, adaptive reflex to these stressors, and individuals will respond differently to the same stressors. Stress is experienced along a continuum. Some degree of ‘stress’ is inevitable, and, it can be argued, desirable as a challenge to improve performance. Hence, ‘eustress’ denotes positive stress.
However for the purposes of Health and Safety in Employment legislation in New Zealand (NZ) ‘stress’ is viewed as an entirely negative occurrence. The concept of work-related stress is defined by the New Zealand Occupational Safety and Health Service (OSH) as being ‘associated with exposure to particular conditions of work, both physical and psycho-social, and workers’ realisations that they are having difficulty in coping with important aspects of their work situation. The experience of stress is usually accompanied by attempts to deal with the underlying problem (coping) and by changes in cognition, behaviour and physiological function. Although adaptive in the short-term, in the long term such changes may threaten health.’

NZ court rulings highlight the need for employers to attend to the psychological safety of the workplace as well as the physical safety. Employers may find themselves liable for the ‘stress’ experienced by their employees and the role of GPs in assessing the ‘stress’ levels of their patients is likely to increase.

We concluded that case-finding for anxiety and experience of excessive stress met the criteria for inclusion in the tool.

2.5.7 Abuse and anger control: a topic for exploration

I have conducted a comprehensive critique of the evidence for and against screening for domestic violence. This has resulted in a number of peer-reviewed publications and an outline of this critique is presented below. I am sole author in three of these, and one is co-authored by Professor Bruce Arroll. This topic is covered more extensively in this chapter than other issues because my pre-existing interest and research in inter-personal violence was one of my motivations for developing the CHAT. Furthermore, compared with domains such as alcohol misuse and depression, exposure to abuse and trouble with anger control might be considered ‘non-standard’ for inclusion in a multi-item tool.

The term ‘partner violence’ in the partner abuse literature generally refers to violence by men against women. Partner abuse currently does not meet the internationally-recognised criteria for screening. In particular, a systematic review of the evidence of acceptability of screening women for partner abuse in healthcare settings found four studies that met their inclusion criteria, and in these, 15 to 57% of women found routine screening unacceptable.

However I have included it because in NZ screening for domestic violence in primary care settings is recommended by the Ministry of Health (MOH). A number of other countries also advocate screening all adult female patients for partner abuse, including the USA and the UK. They do not advocate screening of asymptomatic men.

The NZ MOH launched the Family Violence Project (FVP) and produced best practice guidelines for identifying and responding to family violence within health care settings in 2002.
with funding provided to train GPs and other health providers to conduct this screening and manage cases of partner violence that they detect. The guideline recommends that all females sixteen years and over presenting in general practice should be routinely screened for abuse by their partners.

The case for or against such screening was considered in accordance with the established screening criteria discussed in Section 2.2.

2.5.7.1 Is partner abuse an important health problem?
Partner abuse can cause significant physical injury, psychological and social sequelae and occasionally death. Most studies show that women sustain more injuries from interpersonal violence (IPV) than their male partners. The 1996 British Crime Survey found equal numbers of men and women (4.2%) said they had been physically assaulted by a current or former partner in the last year. However, women were twice as likely to have been injured by their partner, and three times as likely to have suffered frightening threats. Twenty-three per cent of women and 15% of men said they had experienced a domestic assault at some time in their lives.

A review of epidemiological research found that men and women engage in physical aggression towards their partners in approximately similar frequencies. This is a robust finding in more than 100 studies internationally, for example in the US, Canada, Finland, and Israel. Inter-relationship violence often starts very early in relationships, often with the onset in the dating phase.

In NZ, the Dunedin Multidisciplinary Health and Development longitudinal cohort study found that within partnerships, women used more physical violence than men, and this was both women reporting perpetrating more partner violence than men, and men reporting more victimisation than women. However far fewer of the sample defined this violence as ‘assault’ causing physical harm, and among those who did, more men than women were named as perpetrators. The findings suggest that about four men assaulted women for every one woman who assaulted a man.

Studies of patients attending emergency departments have found significant levels of reported IPV. In one Australian study adult IPV was reported by 19% females and 8.5% males, and a second study found 24% women and 8.5% men disclosed a history of adult IPV. Generally it can be accepted that while men and women engage in inter-personal aggressive acts at about equal frequency, women are between two to four times as likely to suffer significant injury and be fearful of their partner.
Both men and women can inflict fatal injuries on their partners. Generally more males than females commit partner homicide\textsuperscript{163-165} but in some cases the accessibility of hand-guns is playing a role in ‘equalising’ the gender physical power imbalance.\textsuperscript{166}

NZ partner homicide figures are not routinely available from government Ministries. While the majority of perpetrators will be male, men are also killed by women. One study of intentional homicides or murders between heterosexual intimates (where the offender meant to cause the death of the person killed) in NZ between 1988 to 1995 found 80 (78.4\%) male and 22 (21.6\%) female offenders.\textsuperscript{167} These figures indicate an average of 10 women and three men murdered by their partners each year. Another study of NZ homicides from 1978 to 1987 found that 82 men and nine women killed their partners during that period.\textsuperscript{168} In 2010 the first annual report of NZ police statistics on culpable deaths was produced, which recorded that in 2007, four men and eight women were killed by their partners, and in 2009 three men and 14 women,\textsuperscript{169} which averages out to 3.5 men and 11 women per year, very similar to the 1998 to 1995 figures.

It seems that between 10 and 20 New Zealanders will die from partner homicide annually. If one of the desired outcomes of screening is to reduce the annual death rate from IPV, because these are such small numbers it will be difficult to determine whether a national screening programme is making any significant difference.

2.5.7.2 \textit{Is there clear definition of partner abuse available?}

Like any abuse, partner abuse is a continuum. Partner abuse is defined as physical or sexual violence, psychological/emotional abuse, or threat of physical or sexual violence that occurs between intimate partners (includes current de facto and married spouses, non-marital and dating partners, and former marital and non-marital partners). Psychological / emotional abuse involves any behaviour causing anguish or fear, and includes intimidation, harassment, damage to property, or threats of physical, sexual, or psychological abuse, and concerted attacks on an individual’s self-esteem and social competence resulting in increased social isolation.\textsuperscript{170} Behaviours such as shouting at a partner, insulting them or their family, controlling what they do or limiting their spending of the family income are considered examples of emotional abuse.\textsuperscript{171}

Using such a broad definition will clearly result in a high identified incidence of partner violence within the community. While slamming a door or raising one’s voice may be undesirable actions, if partner abuse is to be screened for, a ‘cut-off’ point of what constitutes ‘serious’ abuse needs to be determined. The screening questions suggested by the MOH\textsuperscript{41} chiefly focus on physical or sexual abuse, but they also include possible emotional abuse by a partner.

To be able to determine whether a screening programme works, it is essential for the condition criteria to be accurately defined. The majority of episodes of minor partner abuse will not progress to incidents that have serious physical or psychological sequelae. The aim of
screening is the early detection of a condition in order to apply preventive or early intervention health care strategies. In this case we are screening for a partner abuse history that is likely to escalate to more serious outcomes should detection not occur. A clear definition of the condition is not currently available.

2.5.7.3 Does a suitable test for partner abuse exist?
For a national screening programme to be introduced, there should be evidence that the proposed screening tool can accurately detect the condition (the sensitivity and specificity of the test should be known), measured against a reference diagnostic standard.

Determination of the occurrence of partner abuse mostly relies on self-report by a patient. The test recommended as a minimum is a routine inquiry by a GP of all female patients aged sixteen or older on their initial visit, as to whether they have experienced any physical, sexual or psychological abuse by a partner in the past year. The guidelines say that ideally this inquiry should also include whether such an event has ever occurred anytime in their lives. Thereafter women should be screened annually regarding any partner abuse over the past year. Male patients should only be screened for abuse when they present with signs or symptoms indicative of abuse. The guidelines advise asking about partner abuse using “simple, direct questions, asked in a non-threatening manner”.

The guidelines suggest that emotional abuse may be screened with a question such as “Does anyone in your home make you feel no good or worthless?” They also suggest the use of two versions of a partner violence screen (PVS) said to “have been validated for sensitivity and specificity”.

The standard PVS is a brief three question screen:
1. “Have you been hit, kicked, punched, or otherwise hurt by someone within the past year? If so, by whom?”
2. “Do you feel safe in your current relationship?” and
3. “Is there a partner from a previous relationship who is making you feel unsafe now?”

The PVS was assessed in an emergency room in Denver, US. If one of these questions was positive they were tested against the Index of Spouse Abuse (ISA - a 30 item questionnaire measuring the severity of physical and non-physical abuse inflicted on a woman by her partner) and the Conflict Tactic Scale (CTS – a 19 item questionnaire measuring use of reasoning, verbal aggression and physical violence in resolving conflict). Using the ISA as a reference standard, the sensitivity of the PVS in detecting partner violence was 64.5% and the specificity was 80%. Using the CTS, the sensitivity was 71% and the specificity was 84%. Forty-three of the 322 women screened (13%) were false positives – they did not report abuse on the reference standards.
The alternative PVS suggested includes screening for physical, sexual and emotional abuse and has four questions:

1. “Have you ever been emotionally or physically abused by your partner or someone important to you?”
2. “Within the last year, have you been hit, slapped, kicked or otherwise physically hurt by someone?” (Mark the area on a body map and score with respect to nature and degree of harm)
3. “Within the last year, has anyone forced you to have sexual activities?” (if yes, by whom and number of times)
4. “Are you afraid of your partner or anyone you listed above?”

No references are supplied to confirm the validation of this alternative screening tool hence the rates of possible false positives and false negatives are unknown.

There are other several screening tools for IPV not discussed in the guidelines. The HITS (Hurts, Insults, Threatens, Screams) is a four item paper-and-pencil screening tool being researched in Chicago\textsuperscript{172} containing the following four questions:

How often does your partner:

1. Physically hurt you?
2. Insult you or talk down to you?
3. Threaten you with harm?
4. Scream or curse at you?

The 5-point responses are ‘never’; ‘rarely’, ‘sometimes’, ‘fairly often’ and ‘frequently’. This screen was tested against the verbal and physical aggression items from the CTS. The correlation between the HITS and modified CTS scores was reported as 0.85 but sensitivity and specificity data were not presented.

Another screening instrument under development is the seven question WAST (Woman Abuse Screening Tool).\textsuperscript{30} This is reported to have correlated well with scores on another diagnostic tool, the ARI (Abuse Risk Inventory) in a small sample of patients.\textsuperscript{173}

While there is some early work in this area, validated screening questions for use in general practice are not yet available. In particular, the tool recommended by the MOH guidelines (the PVS), which specifically addresses physical assault and issues of perceived safety, has not been validated in a primary care setting. The validation study conducted in an American emergency room gave a 10% false negative and a 13% false positive rate. No sensitivity and specificity data are available at all for the alternative suggested tool. The guidelines offer no method to determine what constitutes significant partner abuse warranting intervention. No diagnostic tool is offered should there be a positive response to the screening questions, and the possibility of false positives is not raised.
2.5.7.4  *Is the test for partner abuse acceptable to the population?*

A number of studies have directly or indirectly assessed the acceptability to women of being asked about partner abuse in various health settings. Some examples of these are found in Table 2.1. For example, in a US health survey of 2000 women, 49% thought that routine screening for IPV would offend or embarrass women, and 28% felt that women who were not being abused would be insulted. The majority thought abused women would be glad someone took an interest and it would make it easier for them to get help, although 43% also thought that it would put abused women more at risk of being hurt by their abuser. In this sample, over half the women were not fully supportive of the concept of routine screening.

The Table shows that there is a large variability in the percentage of women who object to being screened for partner abuse – up to 50% in some cases. Variables include the method of screening (which questions asked; verbally or written; by whom); the setting (general practice; antenatal clinics; emergency rooms; women’s refuges) and whether or not the woman has been abused.
Table 2-1: Acceptability of Partner Abuse Screening to Women

<table>
<thead>
<tr>
<th>Study authors</th>
<th>Type of study</th>
<th>Sample</th>
<th>Setting</th>
<th>Attitude to screening</th>
<th>Comments on study</th>
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</thead>
<tbody>
<tr>
<td>Bradley et al, 2002&lt;sup&gt;29&lt;/sup&gt;</td>
<td>Cross-sectional, self-administered anonymous survey</td>
<td>1871 women attending for consultation</td>
<td>22 volunteer Irish general practices</td>
<td>118 (7%) objected to screening; 216 (13%) uncertain</td>
<td>Large sample of consecutive patients from 22 general practices</td>
</tr>
<tr>
<td>Brown et al, 1996&lt;sup&gt;30&lt;/sup&gt;</td>
<td>Survey of comfort level in answering 8 item screening tool</td>
<td>24 abused women, 24 non-abused women</td>
<td>Volunteer women from a shelter for abused women; comparison group from researcher’s professional contacts</td>
<td>Abused women reported significantly lower comfort ratings to non-abused women especially questions about physical and emotional abuse. Abused women’s comfort ratings ranged from 2.1 to 2.9 where 1 = not at all comfortable to 4 = very comfortable</td>
<td>Small convenience sample</td>
</tr>
<tr>
<td>Caralis &amp; Muialowski, 1997&lt;sup&gt;31&lt;/sup&gt;</td>
<td>Cross-sectional interviews</td>
<td>406 women</td>
<td>Primary care and medical out-patient clinics</td>
<td>15% objected to screening</td>
<td>Large sample assessing acceptability of screening through interviews</td>
</tr>
<tr>
<td>Feldhaus et al, 1997&lt;sup&gt;32&lt;/sup&gt;</td>
<td>Prospective survey Assessment of 3-question screening tool</td>
<td>491 women presenting during 48 randomly selected 4-hour time blocks</td>
<td>2 urban hospital emergency departments, Denver, Colorado</td>
<td>No evaluation of acceptability to patients. 11% refused to participate</td>
<td>Measured declining to participate but not acceptability</td>
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<tr>
<td>Study authors</td>
<td>Type of study</td>
<td>Sample</td>
<td>Setting</td>
<td>Attitude to screening</td>
<td>Comments on study</td>
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<tr>
<td>Friedman et al, 1992&lt;sup&gt;33&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>164 patients</td>
<td>Public &amp; private primary care</td>
<td>25% women and 15% men did not favour routine screening of women</td>
<td>Moderate sample including both women and men</td>
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<tr>
<td></td>
<td>Self-completed questionnaire</td>
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<tr>
<td>Gielen et al, 2000&lt;sup&gt;34&lt;/sup&gt;</td>
<td>Case-control</td>
<td>202 abused women</td>
<td>Randomly selected women in health maintenance organisation, Washington DC</td>
<td>52% objected to routine IPV screening</td>
<td>Random sample, moderate size, included both abused and non-abused women</td>
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<tr>
<td></td>
<td>Telephone interviews</td>
<td>240 non-abused women</td>
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<td>59% non-abused women</td>
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<td></td>
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<td></td>
<td>46% of abused women</td>
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<tr>
<td>Glass et al, 2001&lt;sup&gt;35&lt;/sup&gt;</td>
<td>Anonymous survey &amp; review of medical records</td>
<td>All women (4,641) who presented during 309 selected shifts</td>
<td>11 middle-sized hospital emergency departments (ED) in Pennsylvania &amp; California</td>
<td>74% response rate (6% refused to participate). 11% non-abused women; 20% abused women did not support screening</td>
<td>Large sample in ED settings measuring acceptability in both abused and non-abused women</td>
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<td>Hetrick, 1996&lt;sup&gt;36&lt;/sup&gt;</td>
<td>Convenience sample</td>
<td>56 abused women</td>
<td>Auckland women's support groups</td>
<td>11 (19%) said they would not have liked their GP to ask them about IPV</td>
<td>Small convenience sample but specifically addresses GP asking women</td>
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<tr>
<td>Authors</td>
<td>Type of study</td>
<td>Sample</td>
<td>Setting</td>
<td>Attitude to screening</td>
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<tr>
<td>Mazza et al, 2000&lt;sup&gt;37&lt;/sup&gt;</td>
<td>Cross-sectional questionnaire-based prevalence study</td>
<td>3026 women (&gt;18 years) attending for consultation Questionnaires distributed in waiting rooms</td>
<td>15 general practices in Melbourne</td>
<td>72% response rate Indirectly, indicates that up to 28% did not want to answer questions about IPV</td>
<td>Large sample but measured declining to participate but not acceptability</td>
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<tr>
<td>McNutt et al, 2002&lt;sup&gt;174&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>80 women at family practice 91 women from IPV programmes</td>
<td>urban family practice &amp; 4 urban IPV programmes</td>
<td>58% non-abused; 52% abused women did not favour routine screening</td>
<td>Small to moderate sample size measuring acceptability in both abused and non-abused women</td>
</tr>
<tr>
<td>Richardson et al, 2002&lt;sup&gt;39&lt;/sup&gt;</td>
<td>Self-administered questionnaire &amp; review of medical records</td>
<td>1207 women (&gt;15 years) attending for consultation</td>
<td>13 randomly selected general practices in Hackney, East London</td>
<td>At least 202 (20%) objected to screening for IPV</td>
<td>Large sample size measuring acceptability of screening in general practice</td>
</tr>
<tr>
<td>Stenson et al, 2001&lt;sup&gt;40&lt;/sup&gt;</td>
<td>Exploratory study Content analysis</td>
<td>879 consecutive pregnant women</td>
<td>Swedish antenatal clinic ‘Please describe how you felt about being questioned by your midwife concerning violence’</td>
<td>175 (19.9%) not acceptable: 106 (12%) neither acceptable nor unacceptable; 42 (4.8%) both acceptable &amp; unacceptable; 27 (3%) unacceptable</td>
<td>Large sample size measuring acceptability of screening in antenatal clinics</td>
</tr>
</tbody>
</table>
A systematic review of the evidence of acceptability of screening women for partner abuse in healthcare settings found that most studies were methodologically flawed. Only four studies met their inclusion criteria. In these studies 15 to 57% of women found routine screening unacceptable.

Similarly, most studies indicate that the majority of general practitioners and other primary care workers are not in favour of screening for IPV. A summary of these can be found in Table 2-2.

**Table 2-2 Acceptability of Partner Abuse Screening to Health Care Workers**

<table>
<thead>
<tr>
<th>Study authors</th>
<th>Type of study</th>
<th>Sample</th>
<th>Setting</th>
<th>Attitude to screening</th>
<th>Comments on study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellis, 1999</td>
<td>Anonymous questionnaire</td>
<td>40 nurses</td>
<td>Urban trauma centre, US</td>
<td>48% did not favour screening</td>
<td>Emergency room not primary care</td>
</tr>
<tr>
<td>Friedman et al, 1992</td>
<td>Anonymous questionnaire</td>
<td>27 primary care physicians</td>
<td>Public &amp; private primary care</td>
<td>66% did not agree with routine screening</td>
<td>Small sample of doctors in primary care settings</td>
</tr>
<tr>
<td>Richardson et al, 2001</td>
<td>Anonymous questionnaire survey</td>
<td>195 GPs, 112 practice nurses, 94 health workers</td>
<td>Primary care, East London, UK</td>
<td>36% uncertain, 50% objected to screening</td>
<td>Moderate sample in general practice</td>
</tr>
<tr>
<td>Rodriguez et al, 1999</td>
<td>Cross-sectional survey using mailed questionnaire</td>
<td>400 physicians (149 family physicians; 115 internists; 136 obstetricians)</td>
<td>Clinics in California, US</td>
<td>10% routinely screen new patients; 9% screen during periodic check-ups</td>
<td>Large sample not only in primary care. Measured screening rate not acceptability</td>
</tr>
<tr>
<td>Sugg &amp; Inui, 1992</td>
<td>Semi-structured interviews</td>
<td>38 physicians (34 family physicians &amp; 4 internists)</td>
<td>Primary care, predominantly white middle-income region, Seattle, US</td>
<td>55% feared screening would offend patients</td>
<td>Small to moderate sample of doctors. Measured acceptability of screening</td>
</tr>
</tbody>
</table>

A survey of American primary care physicians serving a predominantly white, middle-income population indicated that most doctors were not happy with the idea of routinely asking women patients about IPV. More
than half thought that the patient would be offended if they asked. Other concerns included their belief that IPV was more likely to occur in lower socio-economic backgrounds than those of their patients; inadequate interventions available to manage disclosed abuse; and time constraints in dealing with disclosures. Two thirds of 27 primary care physicians in one study did not favour routine screening. Another study of US primary care physicians found that patients’ fear of retaliation was cited as the greatest barrier to identification and referral of patients suffering intimate partner abuse. Only 52% of 40 US emergency nurses surveyed supported routine screening of women for IPV, even though most of them (87.5%) had received specific training in IPV screening.

In an anonymous survey in the East London in the UK only 10% of GPs, 8% of the practice nurses and 9% of health visitors favoured routine screening. Overall, 50% disagreed with screening and another 36% were uncertain.

In general, studies of both patients and health providers’ views of screening are of poor quality, often with low response rates and methodological flaws. However the evidence that is available indicates that routine screening is unacceptable to a significant percentage of both women patients and primary care providers, including GPs. Even if only 10% of women object to IPV screening, this is likely to be unacceptable in the NZ primary care environment. Imposing a screening regime on female patients when one in ten found it to be objectionable is potentially damaging to their doctor-patient relationships and ultimately to their practice.

2.5.7.5 **What are the benefits of screening for partner abuse?**

The potential benefits of routine screening would be earlier detection of partner abuse and the application of appropriate interventions to prevent the on-going abuse, and hence reduction in the incidence of subsequent psychological sequelae, physical morbidity and deaths. Data from the 1980s and 1990s indicate that an average of 11 women and three men are murdered by their partners each year. There is currently no evidence to indicate that routine annual IPV screening of all adult women would prevent these deaths.

A study which evaluated the impact of a protocol on partner abuse aimed at increasing identification and improving acute management of abused women by emergency department staff found no difference in their overall identification but an increase in confirmed cases and interventions offered. However a follow-up study found that a year later these effects were not sustained. The incidence of partner abuse would be expected to be less in the population of patients presenting to their GP than those presenting to a hospital emergency department.

This indicates that at best national routine screening in primary care will have modest gains with respect to identification of cases of inter-partner violence. Ensuring that GPs sustain their screening behaviour is likely to require considerable on-going training, prompts and other encouragement. Despite the current MOH directive, there is more indication for targeting case-finding rather than routine annual mass screening.
2.5.7.6 What are the harms of screening for partner abuse?

The possible harms from screening include complications arising from the investigation, false negatives (some cases are missed), false positives (women are wrongly identified as positive cases), adverse effects of labelling or early diagnosis and unnecessary treatment of true-positive cases who have inconsequential disease or conditions.

Given that the test in question consists solely of verbal inquiry, the harmful effects of invasive investigative techniques are not a consideration here. However it is possible that some patients might be offended or upset by the question and the doctor-patient relationship might be negatively affected. No study has been carried out to measure the potential harm to women that could occur from routine IPV screening. 133

Screening all women for partner abuse will not detect all cases, difficulties in definition aside. Some women will choose not to tell their GP about their relationship with their partner, hence there will be some false negatives. The validation study of the PVS found a 10% false negative rate. 32

The guidelines advise GPs that should a patient disclose abuse from a partner, that they should acknowledge what they have been told and validate it. 178 It is suggested that GPs tell their patients that they did nothing to deserve or provoke the abuse, that it is never justified and that what the perpetrator is doing is a crime, it is not just a family or private affair. While this may well be the case in instances of unprovoked physical violence of one partner by another, this will not apply to all instances of partner abuse, especially using the broad definition given. While physical violence is never justified, a significant percentage of partner abuse is reciprocal.

In general, studies indicate that women initiate physical violence at least as often as men 145 and that at least half of partner violence is mutual. Minor acts of violence by a female partner significantly increase the risk of assault by her male partner, sometimes with severe consequences. 179

Data are emerging that are inconsistent with the theory that women largely resort to violence only as a pre-emptive strike or in self-defence. In a study of dating relationships of over 600 university students it was found that the majority of the abuse was reciprocal, with males and females equally responsible for ‘starting’ the violence, and that as one partner became more violent, there was a greater likelihood that the other partner would reciprocate. These results suggest that the roots of at least some of the violent behaviour lie within the couple ‘relationship’ rather than within individuals. 180

One possible consequence of this reframing is that because the screening questions ask only about abuse they have experienced but not whether they have themselves abused their partners, there will be cases where patients’ own actions will not be questioned. Reassuring these women that they are in no way to blame for the abuse (when in fact they may have initiated the physical violence) may deny them the opportunity to examine
their own behaviours and take responsibility for their own abusive actions. By not considering the possibility that partner abuse may have this reciprocal nature and that both parties are co-perpetrators rather than perpetrator and victim, patients may feel reluctant to admit to their own problems of anger management.

Labelling a woman who discloses that sometimes her partner makes her ‘feel no good or worthless’ as a ‘victim of domestic violence’, and labelling her partner as a criminal, might inflate their marital conflict into a more major problem than it is in reality, and may adversely affect how the woman views her relationship and her partner’s behaviour.

Of the referral agencies suggested in ‘Response to family violence’ for intervention of disclosed partner abuse, all assume that the patient (usually female) is the victim and the partner (usually male) is the perpetrator. The interventions involve legal actions and victim support, and ‘Stopping Violence’ programmes for men. Most of the interventions encourage or require that the couple separate (the appropriate course of action should one party be at real risk of harm should they stay in the relationship). Such measures may however be inappropriate for patients and their children whose disclosures indicate a degree of disharmony in their relationship that does not seriously endanger them.

2.5.7.7 How do benefits and harms compare in different people?

The benefits of screening are greater for people at higher risk of the condition. Consideration should therefore be given as to whether screening should be directed at the high-risk population rather than the entire adult female population.

While partner abuse can occur in all socio-economic strata, it is more likely to occur in patients from low socio-economic and socially deprived backgrounds. People who are violent towards their spouses are more likely than the general population to engage in violence towards other people. The American National Survey of Families and Households found that both men and women who report physical violence in their marriages were very similar to those who were at increased risk of interpersonal violence in general. Those at greatest risk of using violence were young people, the less educated, those with low incomes, urban dwellers and Blacks.

In general, an increased rate of family violence is associated with stressors (such as loss of jobs, family deaths) and poverty, although needless to say, most stressed or poor people are not violent. The Dunedin cohort study found that partner violence is strongly linked to cohabitation at an early age; a variety of mental illnesses; a background of family adversity, early school leaving and juvenile aggression; conviction for other types of crime, especially violent crime; drug abuse; long-term unemployment; and motherhood at an early age.

The Social Policy Branch of the Ministry of Māori Affairs reported that “Māori are over-represented as victims and perpetrators of family violence.” Nearly half of the women attending Women’s Refuges, and nearly half the reported abusers, are from the 15% of the population that is Māori. Data are not available as to whether this
is a true racial and cultural difference, or whether it is a reflection of the greater representation of Māori in the lower socio-economic bracket. The Women’s Safety Survey conducted in New Zealand in 1998 similarly found a disproportionately high rate of partner abuse among Māori.  

The Dunedin cohort study found that women from all social strata were liable to be violent, but there was an increased risk for men to be violent if they were poorly educated, unemployed, and lacked social supports. These data suggest that men from higher socio-economic groups with better educational status are less likely to engage in violent acts against women.

A 1996 NZ victimisation study surveyed a random sample of 5000 people over the age of fifteen. One of the most striking results reported was that most people have little exposure to violence or threats, but there is a small percentage of the population for whom violent events are nearly commonplace. Only 0.5% of the sample (6% of those who had been victimised) had been victims of a violent offence 5 or more times, but this group was subject to a massive 68% of the overall violent offending. The average number of assaults in a year for these victims was twelve. Within the family, violence to a partner is often a chronic behaviour pattern, and those who do offend (both men and women) are likely to carry out repeated acts of violence within a one year period.

The relationship between family violence and psychiatric disorders was studied using diagnostic interviews of 1200 randomly selected residents of a large Canadian city. Those with psychiatric diagnoses, both men and women, had an increased risk of exhibiting violent behaviour, especially if they had a diagnosis of anti-social personality, recurrent depression and /or alcoholism. The partners of such people could therefore be considered a high-risk group to consider screening.

There are also factors relating to reciprocity of violence. Even minor violence by women increases the probability of severe assaults from their male partners. Being in a marital relationship does have a socialising effect on men. Men in intact marriages are less likely to engage in violence generally.

It therefore would be possible to narrow down a screening programme considerably by focusing on high risk groups and hence reducing false positives, thereby increasing acceptability without major loss of effectiveness.

Is there evidence that earlier intervention works?

Before a routine screening programme is introduced, there should also be evidence from randomised controlled trials (RCTs) that earlier intervention is effective.

Good quality evidence is currently not available regarding effective interventions to prevent or manage partner abuse. No RCTs have been conducted to test the effectiveness of interventions for partner abuse. Those available have been comparative studies conducted in emergency departments, antenatal clinics, and one in a US community health centre. Most interventions involved staff training programmes and /or the
use of standardised protocols for screening for domestic violence (DV), or more specifically inter-partner violence (IPV), and the primary outcome measure was the rate of referral for IPV to outside agencies. Increased referral rate does not inform about the resultant outcomes for the women, for example their quality of life or mental health status. While the studies generally demonstrated an increased number of cases identified following the intervention, this was modest and there was no evidence that this effect was sustained over time. The interventions referred to in the Ministry of Health guidelines are not early interventions; rather they are crisis-orientated and directed at women who have already been injured by IPV and are at serious risk of this being repeated. The strategies focus on an exit plan – how a woman can safely leave her partner.

The referral agencies recommended similarly offer support to women to help them leave their partners. Women can use women's refuge to provide emergency accommodation, assistance in obtaining emergency funds and help them use the services of the police and lawyers to apply legal remedies, such as obtaining a protection order or laying charges against the partner. The National Network of Stopping Violence Services provide programmes for violent men and support services for abused women, but again, this is usually in the context of the couple separating.

In a NZ study, the majority of women who reported physical abuse by their partners wanted it to stop, but most did not want to leave their partners. Furthermore, living on their own does not necessarily reduce women's risk of violence. Solo mothers and women living alone are at greater risk of assault than those living in intact families. Furthermore, many women who leave extremely violent relationships subsequently form new relationships with partners who are equally violent towards them.

Clearly if there has been a history of significant physical abuse, in the interest of safety separation may be the only viable option. However effective approaches are not available for couples who engage in mutual, less severe physical abuse such as pushing or slapping, or who use non-physical abusive behaviours such as yelling and insulting each other.

I conducted a pilot evaluation of a community-based early partner abuse intervention, ‘Positive Partners, Strong Families’, which used behavioural/cognitive techniques to teach communication, negotiation and conflict resolution skills to couples in Auckland. Psychologist Dr Tannis Laidlaw was a co-investigator. Initial data demonstrated that couples attending this course showed significant improvement in measures of consensus, satisfaction, affection, cohesion and use of reasoning to resolve conflicts in their relationships, and these improvements are sustained at six months follow-up. While these data look promising, such interventions are generally not available in the community.
Is screening for partner abuse cost-effective?

In 1994 the then-Department of Social Welfare released a report that estimated that the economic cost of family violence is at least $1,187,000,000. This was based on an assumed prevalence rate of 14% - one in seven women and one in seven children being victims of family violence. The figures included costs to the individual and to the government for healthcare, welfare, justice and law enforcement. This $1.2 billion figure is commonly quoted in government and other publications. However, critical analysis of the study indicates severe methodological flaws, including assumptions about prevalence and potential over-estimates on many of the parameters used in the calculations.

The cost of the Ministry of Health initiative introducing the screening programme is unknown. It included the costs of training programmes to be provided nationwide to health professionals working in paediatric services, emergency departments, midwifery services, general practice settings, sexual health clinics, family planning clinics, well child services, iwi and pacific health settings, with $219,000 budgeted for the evaluation of these training programmes.

While the $1.2 billion cost of IPV appears likely to be a gross over-estimate, there are clearly considerable costs to our society, both human and financial, from partner violence. If screening for IPV significantly increased detection of cases and at an earlier stage, and effective interventions were applied, then it would be expected that there would be a decrease in healthcare, law enforcement and judiciary costs, as well as a reduction in human suffering.

Studies indicate that a fifth to a third of partner assaults are suffered by men. A programme that routinely screens all women but only questions men with signs and symptoms indicative of partner abuse is unlikely to detect most cases of male victims of IPV, who still suffer injuries although on average of lesser severity.

Most screening is not usually cost-saving but it is accepted that it is worthwhile spending ‘x’ dollars to gain one quality adjusted life year. However, since there are no studies of effectiveness, cost-effectiveness cannot be assessed.

Summary regarding partner abuse screening in primary care

Inter-partner violence, especially against women by male partners and ex-partners, is a serious public health problem. Clearly, reducing IPV is a laudable aim, with significant public health gains. To address this, the MOH recommends routine annual screening of all woman aged 16 and over for partner abuse.

However, for a screening programme to be effective there must be an accurate test for the condition and scientific evidence that screening can prevent adverse outcomes. The test must be able to detect the target condition earlier than without screening and with sufficient accuracy to avoid producing large numbers of false-
positive and false-negative results. Screening for, and treating persons with, early disease should improve the likelihood of favourable health outcomes (for example, disease-specific morbidity or mortality) compared with treating patients when they present with signs or symptoms of disease. None of these criteria are met. Furthermore, such screening is unacceptable to a significant percentage of women patients and primary health providers. Under these conditions, implementation of a routine screening programme in isolation for all adult women cannot be justified.

However, GPs should be encouraged to learn about partner abuse and to actively engage in case-finding. They should consider the possibility of its occurrence in patients presenting with physical injuries, psychological disturbance or social dysfunction and be aware of factors associated with a high risk of partner abuse (including a background of family adversity, early school leaving and juvenile aggression, poverty and unemployment, being Māori; cohabitation or motherhood at an early age; drug abuse or alcohol abuse, mental illness or criminal convictions) and be particularly vigilant in considering the possibility of partner abuse in high-risk patients.

In the multi-item tool it was decided not to screen for domestic abuse of women by men, but to ask generic questions of all adults regarding both possible victimisation of abuse from another person, and possible perpetration of violence against another. We hypothesised that such questions embedded in a questionnaire about a number of different lifestyle risk factors and problems with mood would be less likely to cause offence than specific questions about violence from a male partner. Generic questions incorporate possible abuse in any relationship, including child / parent, student / teacher, employee / employer as well as between partners. For example, a solo mother may be experiencing violence from her teenage son, an elderly male from his adult daughter caregiver. We were also aware that patients having trouble controlling their anger in a particular relationship (be it with their child, their partner or a demented elderly parent) may welcome the opportunity to raise this with their GP and possibly be referred to an anger management programme.

2.5.8 Physical inactivity

Physical inactivity has been associated with an increase in risk of several disease states, as well as lower quality of life compared with an ‘active’ lifestyle. Interventions aimed at improving the physical activity of sedentary patients can help to reduce cardiovascular disease, diabetes, obesity, osteoporosis, and symptoms of depression as well as improve quality of life.\textsuperscript{201} The prevalence of inactivity is estimated to be 32\%\textsuperscript{202} to 42\% in NZ,\textsuperscript{64} although the prevalence is even higher in countries like the US (60\%) and the UK (70\%).\textsuperscript{203,204} In particular, approximately 24\% of all cardiovascular mortality can be attributed to physical inactivity in NZ.\textsuperscript{205} In other countries, the attributable fraction of cardiovascular mortality due to physical inactivity has been estimated to be as high as 35\% to 39\%.\textsuperscript{203,206} These figures indicate that there is a high health burden due to physical inactivity, and that this is an area of significant health gain potential, should screening and intervention be effective.\textsuperscript{201}
Introduced in the 1990s, the Green Prescription is a written goal-orientated prescription given by GPs or practice nurses to sedentary patients to encourage an increase in physical activity. It is viewed as a tangible reminder to a patient of an exercise plan arrived at by joint discussion between patient and doctor, with the expectation that it will be more effective in increasing the patient’s level of exercise than verbal advice alone.\(^\text{207}\) A Green Prescription specifies the number of minutes and number of times a week that a patient should go for a brisk walk or engage in some other physical activity to be determined by the practitioner and the patient. The Prescription also offers a toll-free number (0800 ACTIVE (0800 22 84 83) allowing patient contact with a local Regional Sports Trust staff member to discuss their exercise programme and provide on-going support by telephone or post.\(^\text{208}\) An RCT has found that the Green Prescription is effective in increasing physical activity and improving quality of life over 12 months compared with usual care\(^\text{201}\) as well as being cost-effective.\(^\text{209}\)

### 2.5.9 Eating disorders

The Australian clinical guidelines for weight control and obesity management state that “Overweight and obesity are present in epidemic proportions throughout Australia: it is estimated that over 67% of adult males and 52% of adult females were overweight or obese in 1999 to 2000.”\(^\text{210}\) In a 1997 NZ survey, 52% of adults were considered overweight (35% adults - 15% males, 19% females) or obese (17% of adults -40% males, 30% females) – see Table 2-3.\(^\text{205}\)

#### Table 2-3 Percentage of New Zealand Population Overweight or Obese

<table>
<thead>
<tr>
<th></th>
<th>NZ European &amp; others</th>
<th>Māori</th>
<th>Pacific people</th>
<th>Total population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>% overweight*</td>
<td>41.0</td>
<td>29.8</td>
<td>30.0</td>
<td>32.7</td>
</tr>
<tr>
<td>% obese(^\text{\text{\textdagger}})</td>
<td>12.6</td>
<td>16.7</td>
<td>27.0</td>
<td>27.9</td>
</tr>
</tbody>
</table>


\(^\text{\textdagger}}\)Obese: BMI > 29.9 for NZ European & others; > 31.9 for Māori &Pacific peoples.188

Overweight poses a health burden at all ages, being associated with a number of diseases caused by metabolic complications and/or the excess weight itself. A modest weight loss of 5-10 % of starting body weight is sufficient to achieve clinically relevant health benefits (level III 2 evidence).\(^\text{210}\)

Obesity is regarded as a disease in its own right, but it is also a risk factor for a large number of other diseases, in particular insulin resistance, type II diabetes, gall bladder disease, non-alcoholic fatty liver disease, obstructive sleep apnoea, polycystic ovarian disease, hypertension, dyslipidaemia and cardiovascular disease. Lifestyle interventions have been shown to be effective at reducing obesity and improving health outcomes.\(^\text{211}\) For example, an intervention that involved a 7% weight-loss and increased physical activity among people with
impaired glucose tolerance, was able to reduce progression to diabetes by 58% compared with usual care over 3 years. In addition, being obese is socially undesirable and there is a great deal of body shape concern among the obese and in many who fear becoming overweight.

Body weight and body mass index (BMI) are physical attributes that can be measured at a general practice or other setting but do not themselves fit within a composite lifestyle and mental health self-report tool. The domain here is healthy eating and nutrition as well as weight. There are many components to this relating to both the quantity and quality of food and drink consumed.

Factors that can be considered include:

- types of food (whole foods such as fruits, vegetables, legumes and grains; fatty and fried foods; meat, fish dairy and eggs; sweet intake including cakes, biscuits and sugary beverages and starchy foods such as bread, rice and pasta)
- food groups including the balance of protein, fat and carbohydrate
- the number or size of portions
- the proportion of the plate that is fruit and vegetables
- specific micronutrients such as vitamin C or iodine
- salt intake (including processed foods)
- foods missing from the diet (including dislikes, restrictions and allergies).

While increasing healthy eating is a worthwhile lifestyle aim, there are no short evaluated questions that can cover this complex domain hence it was decided that case-finding for unhealthy eating was beyond the scope of this brief tool.

As well as the increasing health burden of obesity, there are also people who are not overweight but who have abnormal concerns regarding their body weight or shape resulting in dysfunctional eating patterns such as binge or nocturnal eating, and various compensatory or purging behaviours usually associated with bulimia nervosa and normal weight. Dysfunctional eating patterns may range from various types of overeating to severe food control and restriction which increases the risk of anorexia nervosa. The latter has a lower prevalence but may have a disproportionately high medical morbidity. Screening tools have been developed for identifying eating disorders in primary care settings. For these reasons it was decided to include questions on disordered but not unhealthy eating in the CHAT.

2.5.10 Other possible risky behaviours

There are a number of other risky behaviours in which people engage that have a potential impact on their health and well-being. These include driving behaviour (for example failing to wear seat belts), exposure to environmental hazards (for example, too much unprotected time in the sun), occupational health and safety or
sexual behaviour (such as having unprotected sexual contact with multiple partners). While these may have important heath consequences, we decided that our tool was not the best place to address such issues. Some of these (for example sun and driving safety) are better suited to a population approach through health promotion activities. Others (such as occupational issues) are not generic in nature and may need an individualised approach. Sexual behaviour is a particularly sensitive area and again, there are no suitable generic questions for this domain. If people are not sexually active or are in monogamous relationships, they may object to being asked about sexual activities. Adding more domains would also increase the length of the tool. We therefore considered other possibly unsafe health behaviours but excluded them from addition to our tool.

2.6 Summary of Chapter 2:
In this chapter I have dealt with the need for developing a brief tool for patients to identify risky health behaviours and negative mood states that they wish to address with the help of their GP or other health professional. I have outlined the justification for including specific lifestyle behaviours and mental health issues and reasons why other possible domains were considered but excluded.
CHAPTER 3. TO SCREEN OR NOT TO SCREEN?

3.1 Outline of Chapter 3

The previous chapter indicated that while there are accepted screening criteria and studies have been conducted on the effectiveness of screening, for example for depression, there may still not be consensus on whether or not to screen. Screening criteria act as guidelines but different components may be given different weightings. Ultimately the decision to systematically screen or case-find or not will be directed by value judgements and the importance placed on various aspects including consideration of the specific population in question and availability of potential interventions.

This chapter addresses the question of how even meta-analyses with the same research question can result in opposing recommendations. I was the lead researcher of this descriptive study, with its publication co-authored by Professors Mieke van Driel, Bruce Arroll and Chris del Mar.216

3.2 Introduction to assessment of opposing meta-analyses

Meta-analysis of randomised controlled trials provides us with the highest level of evidence to inform guidelines and clinical practice. Therefore, it is important to get it right. Over the past 20 years much has been done to improve the methodology217-219 and reporting, resulting in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement (http://www.prisma-statement.org/). This has provided a guideline for standardised reporting of systematic reviews which has increased their rigor and transparency. However it is not uncommon that meta-analyses addressing the same research question arrive at conflicting conclusions or recommendations, and reasons for inconsistency have been explored.220-223 For example, two different author groups in a series of meta-analyses of trials investigating the effectiveness of screening for depression, have opposing recommendations, one supporting screening and another questioning its usefulness.75,117,118,224 A preliminary review revealed that in spite of identical research questions, choices about inclusion or exclusion of studies may have shaped the results and conclusions. Throughout the process of meta-analysis many decision moments occur – for example which study to include or exclude, the risk of bias assessment, which data to extract. Even when following strict protocols, subjective decisions need to be made. Each choice can take us down a different path and lead off into another direction. Choices may not be value-free and often many of these decisions remain covert (not explicit) which makes it difficult for readers to interpret their impact.225

Given the discrepancies in recommendations from different reviews on screening for depression, we explored the determinants of this divergence by examining the choices made by the authors in conducting their reviews and reported our own decision-points when conducting our analysis.
3.3 Methodology for assessing opposing meta-analyses

A search was conducted for all systematic reviews and meta-analyses on screening for depression in primary care using the databases MEDLINE, EMBASE, CINAHL, PsycLIT and the Cochrane Database of Systematic Reviews, and hand-searching of the relevant reference lists.

The objectives, findings and conclusions of all accessed reviews were compared (Table 3-1). Two meta-analyses were selected for in depth exploration of the review process. Subsequently, co-author MLVD and I applied a stepwise approach to unravel the review process followed by the authors of the selected meta-analyses. Each decision moment in the analysis process was recorded alongside an appreciation of the decisions reported by the authors of the selected meta-analyses. Discrepancies between the authors of this study and the justification of choices made were recorded. The two other authors of this paper commented on consistency and transparency of the recorded process and findings. The individual RCTs included in each review were identified, accessed and examined.

A table was constructed recording for each RCT the sample size of the trial, whether or not it favoured screening, whether it was included and whether it was pooled in each of the reviews (Table 3-2). The various decisions the authors of the two meta-analyses had made regarding which outcomes to analysis and their data extraction from original studies were explored.
### Table 3-1 Comparison of Research Objectives, Findings and Conclusions in Five Reviews

<table>
<thead>
<tr>
<th>Reference</th>
<th>Objective</th>
<th>Findings</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilbody, 2001</td>
<td>To examine the effect of routinely administered psychiatric questionnaires on the: recognition, management, and outcome of psychiatric disorders in non-psychiatric settings</td>
<td>Included 9 studies (4928 participants). Meta-analytic pooling of 4 studies (2252 participants). Measured the effect of feedback on the recognition of depressive disorders found that routine administration and feedback of scores for all patients did not increase the overall rate of recognition of mental disorders such as anxiety and depression. 2 studies showed that routine administration followed by selective feedback for only high scorers increased the rate of recognition of depression. This increased recognition did not translate into increased rate of intervention. Overall, studies of routine administration of psychiatric measures did not show an effect on patient outcome.</td>
<td>The routine administration of psychiatric questionnaires with feedback to clinicians does not improve the detection of emotional disorders or patient outcome, although those with high scores may benefit. The widely advocated use of simple questionnaires as outcomes measures in routine practice is not supported.</td>
</tr>
<tr>
<td>Gilbody, 2005</td>
<td>To determine the clinical effectiveness of screening and case finding instruments in improving depression: recognition, management, and outcome.</td>
<td>Included 12 studies (4980 participants). Meta-analytic pooling of 11 studies (4837 participants). According to case note entries of depression, screening/case finding instruments had borderline impact; Overall trend to showing a borderline higher intervention rate amongst those who received feedback of screening/case finding instruments. This result was dependent upon presence of 1 highly positive study; 3 out of 4 studies reported no clinical effect at either 6 or 12 months.</td>
<td>There is substantial evidence that routinely administered case finding / screening questionnaires for depression have minimal impact on the detection, management or outcome of depression by clinicians.</td>
</tr>
<tr>
<td>Reference</td>
<td>Objective</td>
<td>Findings</td>
<td>Conclusion</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Gilbody, 2008</td>
<td>To establish the effectiveness of screening in improving the recognition of depression, the management of depression and the outcomes of patients with depression.</td>
<td>Included 17 studies (8349 participants). Meta-analytic pooling of 14 studies (6938 participants). Use of screening or case-finding instruments were associated with a modest increase in the recognition of depression by clinicians. Questionnaires, when administered to all patients and the results given to clinicians irrespective of baseline score, had no impact on recognition. There was no evidence of influence on the prescription of antidepressant medications. No evidence of an effect on outcomes of depression was found.</td>
<td>If used alone, case-finding or screening questionnaires for depression appear to have little or no impact on the detection and management of depression by clinicians. Recommendations to adopt screening strategies using standardised questionnaires without organisational enhancements are not justified.</td>
</tr>
<tr>
<td>USPTF, 2002</td>
<td>What is the accuracy of case-finding instruments for depression in primary care populations? Is treatment of depression in primary care patients effective in improving outcomes? Is routine systematic identification with case-finding questions (screening), with or without integrated management and follow-up systems, more effective than usual care in identifying patients with depression, facilitating treatment of patients with depression, and improving clinical outcomes?</td>
<td>Included 15 studies (6761 participants). Meta-analytic pooling of 8 studies (4190 participants). Compared with usual care, feedback of depression screening results to providers generally increased recognition of depressive illness in adults. Studies examining the effect of screening and feedback on treatment rates and clinical outcomes had mixed results. Many trials lacked power to detect clinically important differences in outcomes. Meta-analysis suggests that overall, screening and feedback reduced the risk for persistent depression. Programmes that integrated interventions aimed at improving recognition and treatment of patients with depression and that incorporated quality improvements in clinic systems had stronger effects than programmes of feedback alone.</td>
<td>Compared with usual care, screening for depression can improve outcomes, particularly when screening is coupled with system changes that help ensure adequate treatment and follow-up.</td>
</tr>
<tr>
<td>Reference</td>
<td>Objective</td>
<td>Findings</td>
<td>Conclusion</td>
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<tr>
<td>USPTF, 2009&lt;sup&gt;121,226&lt;/sup&gt;</td>
<td>To review the benefits and harms of screening adult patients for depression in a primary care setting</td>
<td>17 studies (7495 participants) included in review but not pooled. Primary care depression screening and care management programs with staff assistance, such as case management or mental health specialist involvement, can increase depression response and remission. Benefit was not evident in screening programs without staff assistance in depression care.</td>
<td>The USPSTF recommends screening adults for depression when staff-assisted depression care supports are in place to assure accurate diagnosis, effective treatment, and follow-up. (Grade B recommendation) The USPSTF recommends against routinely screening adults for depression when staff-assisted depression care supports are not in place. There may be considerations that support screening for depression in an individual patient. (Grade C recommendation)</td>
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### Table 3.2 Comparison of Trials Included and Pooled in Five Systematic Reviews of Screening for Depression

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<td>Gilbody, 2007&lt;sup&gt;75&lt;/sup&gt;</td>
<td>USPTF, 2001&lt;sup&gt;119,189&lt;/sup&gt;</td>
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N = Total number in the trial at baseline (control and intervention arms)
Incl = Included for any or all of three outcomes (recognition, management, outcome of depression)
Pool = Pooled for any or all of three outcomes (recognition, management, outcome of depression)
Cells shaded where review was conducted before the RCT was published and hence the study was not available for that review
USPTF = US Preventive Task Force

Page 2 of 2 of Table 3.2
3.4 Results of assessment of meta-analyses

The results of our explorative analysis are presented in the flowchart (Figure 3.1). Five systematic reviews (four with pooled data) were identified. Three meta-analyses were conducted by Gilbody and colleagues between 2001 and 2008, including one Cochrane review. None of these favoured screening. Two reviews (one meta-analysis) from another author group, the US Preventative Task Force (USPTF), in 2002 and 2009 favoured screening (Table 3.1).

The five reviews included a total of 26 RCTs with a total of 12,569 participants. None of these RCTs was common to all reviews (Table 3-2). For example, for the outcome of providing practitioners with feedback on screening (detection of possible depression) prior to initiation of treatment, Gilbody 2001 pooled four RCTs, whereas for the same outcome the USPTF pooled a completely different set of eight RCTs. All of these studies would have been available to both author groups with the exception of the study by Wells, which might not have been published when Gilbody et al conducted their search.

Each of the five reviews considered three different research questions (effectiveness on detection, treatment and patient outcomes) with different combinations of RCTs included for each. Again, none of these were common between reviews. This meant that there were 15 different combinations of RCTs for the five reviews considering the three research questions. For pragmatic reasons we decided to select two reviews with opposing recommendations which addressed the same research question to determine factors leading to discrepant findings.

The two meta-analyses we selected for comparison, one favouring and the other not favouring screening were the Cochrane review by Gilbody of 2005 and the USPTF 2002 meta-analysis. These two meta-analyses contained the most information on both included and excluded trials, had the most overlapping studies and both included pooled data. We decided to focus on only one of the three research questions addressed in the meta-analyses. The outcome of the effect of depression screening on treatment (ie if the patient received treatment for depression) was selected because this is of clinical importance and also included the largest number of studies used in the reviews. We identified RCTs included and pooled in either review and then examined these to determine which most influenced the results favouring not screening or screening. Which studies were pooled or not pooled in either review are outlined in Table 3-3.

We found that the opposing recommendations of the two reviews were largely determined by the Lewis study, pooled in the Cochrane but not the USPTF review, and the Wells trial, pooled in the USPTF but excluded from the Cochrane review.
Table 3-3 Studies Pooled in Two Selected Meta-analyses

<table>
<thead>
<tr>
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Studies pooled by both meta-analysis author groups are highlighted.

On inspection of the forest plot in the Cochrane review for the outcome of management of depression following feedback (prescription of anti-depressants)\textsuperscript{117} (their Analysis 2.2, p 28), the Lewis study\textsuperscript{238} has the greatest weighting (37.5%). It can be seen clearly that this study shifts the plot from favouring screening to not favouring screening. The USPTF included this study in their review but did not pool it for this outcome because they report that the figures “cannot be calculated from available data”. There were 227 patients in each of the control and screened arms. The Cochrane review has entered the Lewis study in their forest plot as 100/227 for control and 125/227 for screening. It is unclear how they have derived these numbers. The Cochrane review states that for the Lewis study they used published data only.\textsuperscript{117} The Lewis study reports that the mean number of psychotropic drug prescriptions for the control arm was 0.44 (SD 1.58) and for the screened arm was 0.55 (SD 1.43) with a p value of 0.6 (their Table 3.4).\textsuperscript{238} However the mean number of drugs prescribed does not necessarily equate to the proportion of patients taking psychotropic drugs. Our own attempts to contact the authors of the Lewis paper to obtain their data have been unsuccessful to date.

The RCT in the USPTF review\textsuperscript{189} which has the greatest weighting and clearly influences the finding favouring towards screening is the Wells study.\textsuperscript{244} This study enrolled 1356 patients who were screened as depressed using the “stem” items for major depressive and dysthymic disorders from the CIDI.\textsuperscript{244} Randomisation was by clinic which either provided usual care (provider not informed that their patients were in the trial) or provided a quality improvement program with either psychotropic medication or psychological intervention (providers notified that their patients had screened positive for depression). The quality of care, mental health outcomes
and retention of employment of depressed patients improved in the intervention group. The Wells study is excluded from the Cochrane review because it is a "Complex quality improvement programme" (Characteristics of excluded studies, p22).\textsuperscript{117}

### 3.5 Discussion on assessment of meta-analyses

What initially presented as a straightforward task revealed itself to be increasingly complex when we discovered that in the five reviews each considering three outcomes, there were 15 different combinations of RCTs. Our in-depth analysis of the process of two meta-analyses that address the same research question but reach contradictory conclusions demonstrates how decisions in the meta-analysis process can shape the conclusion. This is an important finding as evidence-based clinical guidelines and practice recommendations rely on evidence from systematic reviews and meta-analyses.

Two questions come to mind; first, “who is right?” and second, “what drove the decisions?” The second question is the most essential one that requires full attention from meta-analysts. Addressing the fundamental issue of human choices in a methodologically rigorous process might even make an answer to the first and most intuitive question superfluous.

There is ample literature on the impact of publication bias, referring to an overrepresentation of trials with a ‘positive’ outcome in searches, on the conclusions of meta-analyses.\textsuperscript{220,255} This type of bias can be addressed by searching for unpublished data or extending the search to languages other than English,\textsuperscript{218} although it is not clear if this is worth the effort.\textsuperscript{256}

Discrepancies in outcomes of meta-analyses have been documented and are often attributed to selective inclusion of studies.\textsuperscript{221,257,258} Felson describes a model for bias in meta-analytic research identifying three stages at which bias can be introduced: finding studies, selection of studies to include and extraction of data.\textsuperscript{259} He argues that “selection bias of studies [as opposed to selection bias of individuals within studies] is probably the central reason for discrepant results in meta-analyses.” Cook et al determined that discordant meta-analyses could be attributed to “incomplete identification of relevant studies, differential inclusion of non-English language and nonrandomised trials, different definitions …, provision of additional information through direct correspondence with authors, and different statistical methods.”\textsuperscript{260} Another study of eight meta-analyses found “many errors in both application of eligibility criteria and dichotomous data extraction.”\textsuperscript{261}
Figure 3.1 Flowchart of Decision Points and Rationale for Choices when Comparing Contrasting Systematic Reviews
While selection bias and differing data extraction may contribute to discrepancy, our study suggests that the bias begins before these steps. Over three research questions in five different reviews, we found 15 different sets of RCTs were included, yet one author group consistently found against while the other found for screening. Which studies are included and which data from those studies are used involves numerous decisions. To our knowledge, the issue of choices and decision making in the process of meta-analysis has not been studied empirically before.

The methodology of meta-analysis is well developed and is continuously being refined to address identified threats of bias. The process is well documented in numerous text books, of which the Cochrane Collaboration Reviewers' Handbook may be the most widely used. The Cochrane Collaboration, the largest database of systematic reviews and meta-analyses of clinical trials in medicine, requires its authors to produce a protocol describing the intended process of the review before embarking on the review. A strength of Cochrane reviews is that they justify their decisions. Each step is peer reviewed and monitored by editorial groups, ensuring methodological rigor. No matter how rigorously we describe each step in the process, human decisions based on judgement are being made all the time. When documenting each decision we made in our exploration, we ourselves, although experienced reviewers, were astonished by the number of decision moments that occurred. Moreover, some of these decisions could be traced to ‘subjective’ inclinations. For example, our choice to explore the question related to effect of screening on number of patients on treatment, was based on a compromise of the desire to study a clinically relevant question and at the same time have enough material for further study. Documenting each of these decisions and the rationale for the choices could add transparency to the process.

However, there might be an even more fundamental unintentional source of “bias” embedded in the review process. The consistent findings of the two author groups suggest this despite the different combinations of RCTs in each of their reviews. Authors might have a “hunch” of the outcome of their meta-analysis before they even start. It is likely that this “hidden bias” guides the choices that are made on the way. It could be called “hunch bias”.

The main limitations of this study are that we chose to compare only two meta-analyses from the many options available and we have introduced subjectivity by the choices we made. However, making these choices and their potential subjectivity explicit is the main strength of the study.

Meta-analysis is a process and no meta-analysis is value-free. PRISMA involves a 27-item check list (http://www.prisma-statement.org/). We can never standardise everything, especially author bias, so adding another 27 items is not the answer. An additional step of recognising each decision point and being explicit about these choices and their rationale would greatly
increase the transparency of the meta-analysis process. But perhaps the greatest improvement in transparency of meta-analysis can be achieved by asking authors to declare their “hunch” of the outcome before they embark on the review process. This step can easily be built into the review process of the Cochrane Collaboration, where the review protocol precedes publication of the full review. The implicit “subjectivity” of the seemingly “objective” meta-analysis process deserves attention in all published reviews and is an important part of well-informed evidence-based practice.

3.6 Summary of Chapter 3: Science is never value-free

This analysis explored the decisions that were made in the different meta-analyses but did not attempt to answer the question of whether or not screening for depression is justified. While scientific enquiry extends empirical knowledge and directs evidence-based practice, research findings are neither complete nor immutable, and will always rest on the questions we ask and the interpretations we make. Application of generic findings needs to be contextualised. Decisions about health promotion, prevention and clinical management require understanding and application of contextual knowledge, relating to specific populations or individuals and local legal, social and policy circumstances. Whether “to screen or not to screen” will depend on many regional context-specific factors, particularly the availability and accessibility of effective interventions.
CHAPTER 4. LITERATURE REVIEW OF EXISTING SCREENING TOOLS

4.1 Outline of Chapter 4

This Chapter reviews the various single and multiple domain screening tools for risky lifestyle behaviours and mental health issues available at the onset of the CHAT project in 2001 to 2002 and outlines those that had been developed by the time the CHAT had been validated in 2008.

4.2 Screening Tools for Smoking

An early tool for assessing tobacco use was the eight question Fagerström Tolerance Questionnaire (FTQ) developed by Fagerström in 1978 with adult volunteers either attending a smoking withdrawal clinic or personnel at the hospital where the clinic was located. Body temperature and heart rate were used as indicators of dependence (the greater the dependence the less elevation of heart rate recorded when the person smoked a cigarette). The scale was adopted internationally and in 1989 Fagerström and Schneider reviewed studies that had used the FTQ in measuring nicotine dependence. In 14 out of 16 different data sets the FTQ score had statistically significant correlations with plasma nicotine levels or other biochemical markers. FTQ also predicted the success of treatment in placebo-controlled nicotine replacement trials.

However the reliability and validity of the questionnaire and of the individual items had not been established. It was questioned as to whether some of the items were necessary and may in fact add little but error variance to the total scores. In 1991 Heatherton and colleagues examined the relationship between each item and biochemical markers in 254 smokers. They found that two items were unrelated to any biochemical markers and introduced the revised 6-question Fagerström Test for Nicotine Dependence (FTND).

Subsequent test-retest stability of the FTQ and the FTND in two study populations (paid American volunteers and patients who were smokers hospitalised for depression in France) found both tests highly reliable and valid, using the biomarker cotinine, number of years smoked, and the “addictive” factor on the Classification of Smoking by Motives questionnaire as criterion variables. Internal consistency was a little higher for the FTND than for the FTQ.

A subset of the FTND was then developed, the two-question Heavy Smoking Index (HSI) which considers the time to the first cigarette of the day and the number of cigarettes per day.
studies of people attending smoking cessation programmes (one involving 932 participants and the other 1877) looked at the ability of the three tests (FTQ, FTND and HSI) to predict expired air carbon monoxide (which equates to heaviness of smoking) at the beginning of treatment and cessation at end of treatment. FTND was found to be more reliable than FTQ and the HSI performed as well as the FTND. The Revised Fagerström Tolerance Questionnaire (RTQ) contains seven of the original eight FTQ items in altered form plus three new items and has demonstrated substantial improvement in internal consistency and improved prediction of expired alveolar carbon monoxide compared to the FTQ.266

These tools initially were developed as research instruments and there were no specifically developed smoking screening tools for use in primary care. Subsequent to the development of the CHAT, the WHO sponsored the development of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) as a screening instrument in primary care. The validity of the ASSIST was examined in a multi-centre international study involving 1047 participants (350 from drug treatment and 697 from primary care settings).267 The ASSIST for smoking showed significant correlation against the FTQ ($r = 0.78$).

### 4.3 Screening Tools for Alcohol Use

One of the earliest alcohol assessment tools was the Michigan Alcohol Screening Test (MAST), a 25-item questionnaire designed to screen for lifetime alcohol-related problems and alcoholism.268 However its focus on dependency and its length does not make it a suitable general practice screening tool. The CAGE Assessment for Alcohol Abuse is a screening tool for alcohol misuse originally developed in a general hospital population in 1970269 and validated in psychiatric inpatients.270 “CAGE” is a mnemonic for the four questions:

1. Have you ever felt you should Cut down on your drinking?
2. Have people ever Annoyed you by criticizing your drinking?
3. Have you ever felt Guilty about your drinking?
4. Have you ever had a drink first thing in the morning (an Eye opener or early morning drink) to steady your nerves or get rid of a hangover or residual drug effect?

It was subsequently validated in a general practice population against a diagnostic interview. Using a cut-off point of two or more positive replies out of the four questions, it was found to have a sensitivity of 84%, a specificity of 95% and a positive predictive value of 45%.271 In a subsequent validation study in medical outpatients, a CAGE score of ≥ two gave a sensitivity of 74% and specificity of 91%.16 The CAGE has been used as a screening tool in general practice.15

In a six country collaborative project the WHO developed a screening test for alcohol misuse, the Alcohol Use Disorders Identification Test (AUDIT). This is a 10-item questionnaire which
covers the domains of alcohol consumption, drinking behaviour, and alcohol-related problems. Because it focuses on detecting persons with hazardous or harmful alcohol consumption before dependence and permanent harm have developed, it is particularly relevant to primary care settings. A number of studies have found the AUDIT to be reliable and valid, and it has been used for screening and brief intervention programmes in many primary care settings.

The success of the AUDIT led to the WHO development of the ASSIST, described in Section 4.2. The ASSIST for alcohol use showed significant correlation against the AUDIT ($r = 0.82$).

### 4.4 Screening Tools for Other Drug Use

The Drug Abuse Screening Test (DAST) is a 28 question self-report tool designed for clinical screening of illicit drug use. It was initially developed at a centre for treating drug addictions. The DAST was validated against a DSM-III drug abuse/dependence criteria with 501 drug/alcohol patients and attained 85% overall accuracy in classifying patients according to DSM-III diagnosis. A maximum sensitivity (96%) was obtained with a cut-off score of 6 to 7. There are now also 20 and 10 item DAST versions. A number of studies have measured the criterion validity of the DAST against a variety of other measures of problematic drug use although generally in hospital of substance abuse treatment settings not in primary care. It generally was found to be sensitive but not particularly specific, and the cut-off point needs to be high to obtain reasonable specificity in a general population, with corresponding decrease of sensitivity. The DAST's focus on dependence made it less useful for detecting problematic or risky drug use in non-dependent people, hence it was not an ideal primary care screening tool.

In 2001 a two-item conjoint screen (TICS) was reported screening for both alcohol and other drug abuse or dependence. This was validated in primary care patients in Wisconsin, US against the CIDI-SAM as the criterion standard and a urine drug-screening test. At least one positive response to the TICS (the two questions are “In the last year, have you ever drunk or used drugs more than you meant to?” and “Have you felt you wanted or needed to cut down on your drinking or drug use in the last year?”) detected current substance use disorders with 79% sensitivity and 78% specificity.

In the WHO development of the ASSIST, described in Section 4.2, the drug component was validated against the MINI International Neuropsychiatric Interview (MINI-Plus) sections relating to drug abuse and dependence and significantly greater ASSIST scores were found with for those with MINI-Plus diagnoses of abuse or dependence ($p < 0.001$).
4.5 Screening Tools for Gambling

The principal screening for screening for pathological gambling is the South Oaks Gambling Screen (SOGS), a 20-item questionnaire based on DSM-III-Revised criteria for pathological gambling.\textsuperscript{20} It was validated with members of Gamblers Anonymous, university students and hospital employees and found to be highly correlated with DSM-III-R ($r=.94$, $df=747$, $p<.001$). However it was not developed specifically for primary care settings and 20 items means it is not suitable as a general screening test.

The ‘Eight’ test for problem gambling was designed for use in general practice and validated against the SOGS.\textsuperscript{103} A positive response to “Sometimes I’ve felt depressed or anxious after a session of gambling” was found to have a sensitivity of 85.7% and a specificity of 93.5%. However the ‘Eight’ test is not in general use.

4.6 Screening Tools for Depression and Anxiety

In general tools to assess depression were developed earlier than those for anxiety. For example, the Hamilton Depression Rating Scale was published in 1960.\textsuperscript{278} It contained 17 variables but was used to determine the severity in patients already diagnosed as suffering from depression, not as a diagnostic tool for the general population nor specifically for use in primary care settings.

An early tool for screening for depression is the 21 item Beck Depression Inventory (BDI).\textsuperscript{279} This was developed in a psychiatric out-patient setting with the correlation between scores on the BDI and clinician rating of the depth of depression of 0.67 ($p < 0.001$). While shown to be capable of diagnosing depression in general practice, this was in the context of research rather than use as a clinical tool.\textsuperscript{280} The fact that the BDI is copyrighted, with a fee paid for each copy used, further limits its use.

The General Health Questionnaire (GHQ) was developed in 1971, initially as a 60-item self-administered questionnaire concerned with psychological distress or altered behaviour in general practice settings. For each item the patients are asked to compare their recent with their usual state, and items are only counted as being present if they are being experienced ‘more than usual’.\textsuperscript{281} Later versions include the GHQ-30 (with items relating to physical illness removed) and a scaled version, the GHQ-28, which assesses somatic symptoms, insomnia and social dysfunction as well as anxiety and severe depression. The short GHQ-12 is considered more suitable for research studies than for screening in clinical practice.\textsuperscript{282} The GHQ-30 has been found to have a sensitivity of 86% and specificity of 77% measured in 247 general practice patients against a standardised psychiatric interview.\textsuperscript{281} The number of items required to be
completed in the clinical versions of GHQ instruments, limits their use, as well as the fact that they are copyrighted, requiring a fee paid for their use in clinical practice or research.

The Hospital Anxiety and Depression Scale was developed in 1983 and found to be a reliable instrument for detecting states of both anxiety and depression in hospital medical outpatients. The presence of anxiety or depression was independently assessed by clinical interview. The GHQ and HADS are similar but the HADS only asks about psychological symptoms and also does not allow for the response ‘same as usual’ (which scores zero in the GHQ).

A study comparing the HADS with the GHQ-28 in 100 general practice patients who also received a structured DSM-III clinical interview, found a 90% sensitivity for the HADs at a cut-off score of eight, versus a sensitivity of 77% for the GHQ. A larger study of nearly 400 general practice patients found a prevalence of 51% using eight as a cut-off point, and it was contended that “many non-consulting patients with a detectable degree of anxiety or depression are in fact carrying on their lives without severe functional disturbance” and may not need intervention by their general practitioner. In this study the prevalence was 28% when a cut-off point of 11 was used. The authors argued that these issues raised the need for further research before the HADS could be considered as suitable for well-person screening in general practice.

In 1994 Spitzer and colleagues reported on their development and validation of the PRIME-MD (Primary Care Evaluation of Mental Disorders), a standardised procedure for diagnosing mental disorders most commonly found in the general population (depression, anxiety, and somatoform, alcohol and eating disorders). The PRIME-MD consisted of a 27-item self-administered patient questionnaire (PQ) followed by a structured interview by the doctor using a clinician evaluation to follow-up any positive responses on the PQ. The diagnoses were tested against an independent DSM-III telephone interview with good agreement found (k=0.71; overall accuracy rate=88%). However the average time for average time for a primary care physician to complete the PRIME-MD evaluation was 8.4 minutes which limited its usefulness as a screening tool.

A criterion standard study was therefore undertaken in 1997 to 1998 to test the validity of the self-administered component of the PRIME-MD, the PQ or PHQ (Patient Health Questionnaire) against a DSM interview. The study involved 3000 patients from eight primary care clinics in the US. Good agreement was found between PHQ diagnoses and those from the diagnostic interviews (for the diagnosis of any one or more PHQ disorder, k = 0.65; overall accuracy, 85%; sensitivity, 75%; specificity, 90%), which similar to those found in the original PRIME-MD. This suggested that the PHQ had diagnostic validity similar to the original clinician-administered PRIME-MD, and was much quicker to use. An added advantage of the PHQ scales are that they are in public domain and available without cost.
4.7 Screening Tools for Abuse and Anger

The Conflict Tactic Scale (CTS) developed by Straus in 1979 looks at the behaviours used to resolve a conflict by two parties, ranging from calm rational discussion through acts of verbal aggression to the use of physical force. It was developed for measuring intra-family conflicts – between partners or between family members and their caregivers and can either be self-administered (on paper or on a computer) or through a face-to-face or telephone interview. There have been numerous studies published establishing its validity and reliability. It asks both how a person behaves towards someone else and how that person behaves towards them, hence it can be used both to assess the degree of aggressive behaviour to which a person is being subjected and the ways that they behave when conflicted (ie as a measure of anger control). One of the values of the CTS is that it can be used with both parties in a relationship and the degree of symmetry or asymmetry between their responses can be assessed.

The CTS has been criticised because it determines the occurrence of aggressive acts but does not address the context surrounding the disputes between intimate partners. It does not measure the purpose of the violence (for example, if used in self-defence), nor does it measure its effects (whether injuries were sustained). The Revised Conflict Tactics Scale (CTS2) was developed in part to address this. CTS2 measures 39 behaviours in the categories of "Physical Assault," "Injury," "Psychological Aggression," "Sexual Coercion," and "Negotiation." However its length and the sensitive nature of some of the questions (for example "I used force (like hitting, holding down, or using a weapon) to make my partner have sex") limits its use in generic or in clinical settings.

A number of shorter tools have been developed specifically for inter-partner abuse (especially perpetrated by men on female partners) including the PVS, HITS, WAST and ARI, as previously outlined in Section 2.5.7.3. These tools generally address the three elements of abuse of being hurt, threatened or controlled by a partner.

4.8 Screening Tools for Physical Inactivity

A number of physical activity questionnaires have been developed and validated against biophysical markers. However these were tested with healthy volunteers rather than less active or randomly selected participants and for use in research rather than clinical settings.

The Auckland Heart Study (AHS) Physical Activity Three month Recall Questionnaire was developed from components of a number of other questionnaires for use in heart disease and blood pressure studies and subsequently validated against an activity diary. The Green Script Study (GSS) questionnaire, a two-week recall questionnaire was used in an RCT.
evaluating the effect of a Green Script physical activity counselling programme in primary care. Both the AHS and the GSS questionnaires have been adapted for self-administration in a primary care setting and validated using a seven-day activity diary and seven-day pedometer record as reference standards.

A further postal questionnaire, as part of the Aerobics Center Longitudinal Study, was validated against physical fitness using treadmill performance. Its length limits it to research rather than clinical use.

### 4.9 Screening Tools for Eating Disorders

The PRIME-MD includes a section for eating disorders (almost exclusively binge eating in the validation study) but generally has not been adopted as a primary care screening tool. Similarly the self-administered component, the PHQ-ED (Eating Disorder), has seldom been used as a screening tool.

The SCOFF is a five question screening tool for eating disorders:

1. Do you make yourself **S**ick because you feel uncomfortably full?
2. Do you worry you have lost **C**ontrol over how much you eat?
3. Have you recently lost more than **O**ne stone in a 3 month period?
4. Do you believe yourself to be **F**at when others say you are too thin?
5. Would you say that **F**ood dominates your life?

It was originally developed in the context of a specialist eating-disorder clinic. It also has been validated in the primary care setting but had a high false positive rate with a low positive predictive value of 24.4% (12.9% to 39.5%).

A four-question screening tool, the Eating Disorder Screen for Primary Care (ESP), has also been developed and compared with the SCOFF. The SCOFF was found better at ruling in an eating disorder (three or more abnormal responses, LR 11) whereas the ESP was better at ruling one out (one or no abnormal responses, LR 0.0).
4.10 Summary of Chapter 4: Literature Review of Available Screening Tools

In this Chapter I have reviewed the existing tools for screening for substance misuse, mental health issues (depression, anxiety, anger control and eating disorders), abuse and physical inactivity within the primary health care setting which were available at the onset of the CHAT project. The validity of these various tools, their benefits and their limitations, were discussed.
5.1 Background to Chapter 5

In its early development our brief instrument was known as the Lifestyle Assessment Tool and then the Multi-Item Screening Tool (MIST). This name did cause some confusion with possible ambiguity between ‘mist’ and ‘missed’. Furthermore it became apparent that its use is more for case-finding than screening, plus the value of the Help question was clearly demonstrated. Thus it was renamed the Case-finding and Help Assessment Tool (CHAT). For the purposes of this thesis it is referred to as the CHAT.

I designed the tool in collaboration with a team including general practitioners, university researchers, a psychologist and a community-based brief intervention educator of primary care providers. This multi-disciplinary team of advisors and researchers was convened to assist with the development and initial piloting of the CHAT. Since its inception in 2001, a large number of people from School of Population Health, University of Auckland and elsewhere have contributed to the development and research of the CHAT.

A literature search of screening tools for the areas of interest had been conducted (see Chapter 4). Where possible, existing short screening tools (for example, the two-question depression screen\(^\text{245}\) and the question assessing sedentary behaviour\(^\text{201}\)) or key questions from longer tools (for example, the AUDIT\(^\text{97}\)) were incorporated into the screening tool. Most items previously had been validated independently in primary care settings. Further details about selection of the specific questions are outlined below.

The initial CHAT screened for tobacco use, alcohol and other drug misuse, problem gambling, depression, anxiety and stress, abuse, anger management, inactivity and eating disorders. It is a short screening tool which either can be self-administered or completed with the help of primary health care practitioners such as practice nurses and GPs. This chapter meets the first part of Aim 2 of the thesis, which is to describe the development of a brief multi-item tool to identify risky lifestyle behaviours and mental health issues in primary care and community settings, which is acceptable to those completing the tool and to practitioners who might administer or receive and act on the findings. The second part of Aim 2, the acceptability of the tool, including preference for paper or electronic format, is addressed in Chapter 6.
Chapter 5
Development of the CHAT

5.2 Selection of questions for the CHAT

5.2.1 Selection of questions on smoking

Ms Barbara Docherty, a nurse who was then the National Project Director, Tobacco, Alcohol & other Drugs Early Intervention Training Programme (TADS) for primary care practitioners in managing addictions\textsuperscript{297} in the Department of General Practice & Primary Health Care, University of Auckland, contributed to the decision-making regarding questions on tobacco, alcohol and other drug misuse. Professor Ross McCormick, previously Department of General Practice & Primary Health Care, University of Auckland, is a GP with a background in substance abuse and addiction and he also contributed to the substance abuse questions.

The original CHAT case-finding questions asked about the average number of cigarettes smoked each day (from none, less than one a day, one to ten, 11 to 20, 21 to 30 and more than 30) and whether the patient ever feels the need to cut down or stop smoking. The former gives
the current smoking status, and the latter was based on a similar question for cutting down on drinking or other drug use as described below.\textsuperscript{101}

5.2.2 Selection of questions on drinking

The TICS (see Section 4.4) is a two-item composite screen for both alcohol and other drug problems two question primary care screen asking “Have you felt you wanted or needed to cut down on your drinking or drug use in the last year?” and “In the last year, have you ever drunk or used drugs more than you meant to?”. We chose to case-find for problem drinking and other drug use as separate items. Therefore the two case-finding questions we selected for the CHAT regarding alcohol use are “Do you ever feel the need to cut down on your drinking? (tick no if you do not drink alcohol)” and “In the last year, have you ever drunk more than you meant to?”.

The first question on alcohol use in the initial CHAT was “How often do you have a drink containing alcohol?” With the options of monthly or less, 2 to 4 times a month, 2 to 3 times a week or 4 or more times a week. This single question is not a good measure of alcohol consumption because it does not ask the type and amount drunk each day, and does not capture binge drinking which might be infrequent episodes during which a large amount is rapidly consumed. Later iterations of the CHAT removed this question, and the first question became “Do you ever feel the need to cut down on your drinking alcohol? (Tick no if you do not drink alcohol OR do not feel the need to cut down)”.

5.2.3 Selection of questions on other drugs

As noted in Section 5.2.2, we separated the TICS composite questions on drinking and other drug use.\textsuperscript{101} The two screening questions we selected for the CHAT regarding other drug use were “Do you ever feel the need to cut down on your non-prescription or recreational drug use? (Tick no if you do not use other drugs OR do not feel the need to cut down)” and “In the last year, have you ever used recreational drugs more than you meant to?”.

5.2.4 Selection of questions on gambling

Dr Sean Sullivan, a psychologist who conducted his PhD in the Department of General Practice & Primary Health Care, University of Auckland, on screening for problem gambling in primary care, contributed to the gambling questions for the CHAT.

The ‘eight’ questionnaire tool designed by Dr Sullivan\textsuperscript{103} and validated against the SOGS\textsuperscript{298} found a positive response to “Sometimes I’ve felt depressed or anxious after a session of gambling” had a sensitivity of 85.7% and a specificity of 93.5% (see Section 4.5). The two questions (“Do you sometimes feel unhappy or worried after a session of gambling?” and “Does gambling sometimes cause you problems?”) are derived from the ‘Eight’ test.
5.2.5 Selection of questions on depression

Professor Bruce Arroll, an academic GP at the Department of General Practice & Primary Health Care, University of Auckland, has a research interest and expertise in depression in primary care. He contributed to the CHAT questions on depression.

The two questions in the CHAT to case-find for depression are “During the past month have you often been bothered by feeling down, depressed or hopeless?” and “During the past month have you often been bothered by having little interest or pleasure in doing things?” These are the first two questions of the PRIME-MD (known as the PHQ-2) with dichotomous answers (“Yes” or “No”) rather than the four-point Likert scale of “Not at all”, “Several days”, “More than half the days” or “Nearly every day” over the last two weeks.

These questions are derived from the Primary Care Evaluation of Mental Disorders (Prime-MD) – see Section 4.6. While the PRIME-MD performs well at diagnosing more severe disorders according to DSM criteria, it often fails to adequately classify sub-threshold disorders.

A study comparing the test characteristics of the two questions of the PRIME-MD against six previously validated screening instruments reported a sensitivity of 96% and a specificity of 57% compared with the Quick Diagnostic Interview Schedule. A further study evaluated the two questions asked verbally by primary care physicians in a NZ community setting. These were assessed against both the computer assisted CIDI questionnaire (mood module only) and the Prime-MD PHQ. The PHQ has been suggested as a screening tool in its own right, and is a self-administered version of the PRIME-MD diagnostic instrument for common mental disorders.

In a recent study led by Professor Bruce Arroll, from which the prevalence of depression in Māori primary care patients in Auckland was determined, reported above in Section 2.4.5, we used the CIDI as a reference standard, to validate the 2- and 9-question PHQs (PHQ-2 and PHQ-9) in primary care settings. The PHQ-2 comprises the first two questions of the PHQ-9. Co-authors on the paper were myself, Dr Susan Crengle, senior lecturer, Te Kupenga Hauora Māori, Professor Jane Gunn, University of Melbourne, Australia, Professor Ngaire Kerse, Dr Tana Fishman and Dr Karen Falloon, GP academics from the Department of General Practice & Primary Health Care, University of Auckland, and Dr Simon Hatcher, academic psychiatrist, Department of Psychological Medicine, University of Auckland. Consecutive adult patients attending Auckland family practices completed the PHQ-9, after which they completed the CIDI depression reference standard. Sensitivities and specificities for PHQ-2 and PHQ-9 were calculated.
The PHQ-9 and the CIDI were completed by 2,642 patients. Sensitivity and specificity of the PHQ-2 for diagnosing major depression were 86% and 78%, respectively, with a score of 2 or higher and 61% and 92% with a score 3 or higher; for the PHQ-9, they were 74% and 91%, respectively, with a score of 10 or higher. For the PHQ-2 a score of 2 or higher detected more cases of depression than a score of 3 or higher. For the PHQ-9 a score of 10 or higher detected more cases of major depression than the PHQ determination of major depression originally described by Spitzer et al in 1999. This is the largest validation study of the PHQ-2 and PHQ-9, compared with a reference standard interview, undertaken in an exclusively primary care population. The PHQ-2 score or 2 or higher had good sensitivity but poor specificity in detecting major depression. Using a PHQ-2 threshold score of 2 or higher rather than 3 or higher resulted in more depressed patients being correctly identified.

5.2.6 Selection of question on anxiety and stress

The late Professor Ian Falloon, previously at the Department of Psychiatry and Behavioural Science, University of Auckland, was the author of 10-question screening (10-QS), a 10-question screening tool for mental disorders, and contributed to the decision about the question for anxiety.

The question selected for anxiety is “During the past month have you been worrying a lot about everyday problems?”. This is similar both to Falloon’s anxiety question in the 10-QS (“Have you been worrying a lot about everyday problems?”) and to one of the validated screenings questions for anxiety from the PRIME-MD (“In the past month, have you been bothered a lot by worrying about a lot of different things?”).

5.2.7 Selection of questions on abuse and anger control

I am a GP at the Department of General Practice & Primary Health Care, University of Auckland, with a research interest and expertise in abuse and neglect. I was responsible for selection of the abuse and anger questions.

Three elements that are frequently identified as components of intimate partner abuse are being threatened, physically hurt or controlled by one’s partner. A fourth component is unwanted or coercive sexual activity. The CHAT is designed as a generic case-finding tool for all adults 16 and over. It is not gender-specific nor is case-finding for relationship-specific abuse ie for abuse by males on their female partners. The questions chosen were “Is there anyone in your life of whom you are afraid or who hurts you in any way?” and “Is there anyone in your life who controls you and prevents you doing what you want?”. These questions are relevant irrespective of relationship, which include parent /child (might be an adult woman being abused by her teenage son, or an elderly man being abused by an adult caregiver daughter), inter-partner or other relationships such as teacher / student or employer / employee. Because sexual abuse
will often not be relevant in this context, and because this is a particularly sensitive area to explore, specific questions on sexual abuse were not included.

Although it is often recommended to ask about being a victim of abuse, we could find no literature recommending asking about potential perpetrators. In the primary care setting, where all members of families may attend, we considered it valuable to enquire whether someone is at risk of, or is actively engaged in, abusing someone else. The CHAT therefore includes the question “Is controlling your anger sometimes a problem for you?” Anger management programmes are often available for referral but patients will seldom volunteer having a problem with anger control.

A positive response to one or more of the abuse questions or the anger control question leads the clinician to have a conversation about the circumstances this might occur and the nature of the relationship(s).

5.2.8 Selection of questions on physical activity

The question regarding physical inactivity was provided by Dr Raina Elley, a GP in the Department of General Practice & Primary Health Care, University of Auckland who had conducted a clustered RCT on the effectiveness of counselling patients on physical activity in general practice.201,290

The question regarding physical activity/inactivity in the CHAT is “As a rule, do you do at least 30 minutes of moderate or vigorous exercise (such as walking or a sport) on five or more days of the week?” with a ‘no’ response defining patients as inactive. This question is based on current evidence indicating that this amount of activity is beneficial to health and is the recommended level for all to attain to become ‘active’.308

This question was used successfully in Dr Elley’s trial to screen for ‘inactive’ patients, where she found that a brief intervention was effective at increasing levels of physical activity for at least 12 months.201 Her trial also found that this question had a positive predictive value of 81% when compared with the Auckland Heart Study Physical Activity questionnaire, which estimates total and leisure-time expenditure of energy.309

5.2.9 Selection of questions on eating disorders

The original version of the CHAT included questions on eating disorders. Dr Anne-Thea McGill, a GP in the Department of General Practice & Primary Health Care, University of Auckland with a research interest and experience in nutrition and in problematic eating behaviours, contributed to the questions around eating disorders. There was considerable initial discussion about whether to case-find for eating disorders per se (bulimia and anorexia) or other aspects of
disturbed or less than ideal eating. These include body size perception regardless of actual weight, being under- or over-weight, and poor nutritional habits with regard to quantity and proportion of intake of fats, sugars, complex carbohydrates, fruit and vegetables, fibre, protein and micronutrients. However because of the issues discussed in Section 5.2.9, the decision was made to case-find for eating disorders but not for unhealthy eating.

As noted in Section 4.9, the SCOFF, has been shown to be better at ruling in an eating disorder whereas the ESP was better at ruling one out. One of the two best questions of the ESP for ruling out an eating disorder was “Does your weight affect the way you feel about yourself?”. A negative response to this question has been shown to have a negative likelihood ratio of 0.0; 95% Confidence interval 0.0 to 0.34, indicating that false negatives are very unlikely. 215

The selected questions for problem eating in the CHAT were “Do you often feel that you can’t control what or how much you eat?” which is the first question of the PHQ-eating module which screens for eating disorders, and the ESP question “Does your weight affect the way you feel about yourself?”.

5.3 The Help Question

An innovative component of the tool is that respondents are asked whether they want help with particular issues either immediately or later. This addresses where patients are staged with respect to their readiness for potential behaviour change (from pre-contemplative through to ready for action), allows them to prioritise their problems and reduces the burden on the practitioner at the initial consultation.

For any positive response to a case-finding question, patients were asked the question “Is this something you would like the doctor or nurse to help you with?” with the options of “No”, “Yes but not today” or “Yes”.

This is a patient-centred approach which invites patients to consider their various behaviours and mood states and indicate whether they would like help in improving one or more of these.

5.4 Summary of Chapter 5

This chapter has summarised the processes involved in selecting the domains to be covered for the CHAT and determining the specific questions to be asked for each domain, selected or adapted from existing tools. It also introduced the Help question, a specific innovation of the CHAT.
CHAPTER 6. EVALUATION AND ACCEPTABILITY OF THE CHAT

6.1 Outline of Chapter 6

Aims 3 and 4 of this thesis are to describe the development of a brief multi-item tool to identify risky lifestyle behaviours and mental health issues in primary care and community settings. This tool needs to be acceptable to those completing the tool and to practitioners who might administer or receive and act on the findings. The aim is also to embed generic questions on abuse and anger control within a multi-item tool in a manner that is acceptable to patients. This chapter reports on the evaluation which aimed to determine the feasibility of use and acceptability of the CHAT in primary care and community settings. The tool was evaluated in urban and rural general practices in both the North and South Islands of New Zealand, with patients attending both general practitioners and practices nurses (see 6.2). Ethnic differences in lifestyle risk factors and mental health in primary care patients were assessed (see 6.3). Co-occurring lifestyle and mental health issues in the primary care patients who reported concerns about their gambling were assessed (see 6.4) and the CHAT was also evaluated in English language centres of international Asian students (see 6.5). Figure 6.1 shows the various subsections of this Chapter.

Figure 6.1 Outline of Chapter 6 – Evaluation and Acceptability of CHAT
6.2 Evaluation of the CHAT in general practice settings

As well as myself, the researchers involved in evaluation of the CHAT in general practice were Professor Bruce Arroll, Dr Sean Sullivan, Dr Raina Elley and Ms Barbara Docherty, who were all involved in selection of individual questions in the tool in some way. The other researcher was rural GP Dr Ron Janes, who was involved in the evaluation of the tool in a rural general practice setting. Ms Wendy Findlay, Practice Nurse Education Co-coordinator, Southlink Health Inc, co-ordinated the data collection from the 20 Otago practices. The overall evaluation of the CHAT (then known as the MIST) has been published.¹⁸

6.2.1 Evaluation method

Prior to the evaluation project, the compiled CHAT was piloted by GPs Associate Professor Tim Kenealy, Integrated Care, Faculty of Medical & Health Sciences and Professor Bruce Arroll in their own practices which resulted in minor changes to the wording and formatting of the tool.

The tool then was assessed by primary care providers in three settings. A computer-generated random number table was used to select GPs in Auckland city and practice nurses in urban and rural centres in Otago. To increase representation by rural patients, all thirteen rural general practitioners in the Hawkes Bay region were also invited to participate by Dr Janes. Rural general practitioners were defined as those who had a Ministry of Health Rural Ranking Scale score ≥35. Each practitioner was asked to invite 50 consecutive adult (aged 16 years and over) patients attending the practice (including those attending as caregiver of another patient) to complete the CHAT and an evaluation (feedback) sheet which recorded objections to any of the screened topics and positive and negative responses to the tool. Patients unable to understand English or with a mental impairment that precluded meaningful participation were excluded. The forms were self-administered by patients in the waiting room (recruited by a research assistant), or administered by a practice nurse in a consulting room, prior to the patient’s consultation. When a risk factor or condition was detected by the CHAT that the patient wanted addressed, the GP could either deal with the problem at the time of the consultation or schedule an appointment at a later date. All participating practitioners also completed feedback forms on the acceptability and feasibility of use of the tool.

Dr Tane Taylor, previous Chief Clinical Advisor, Raukura Hauora O Tainui acted as a Māori advisor for the project and Dr Vili Nosa, Pacific Health, School of Population Health and Ms Moera Douthett, previously of Pasifika Health Care, Auckland as Pacific advisors.

Data analysis involved descriptive statistics and non-parametric binomial (chi-squared tests) using the SPSS-10.0 statistical package. The data included demographic information, responses to each CHAT question, patients’ objections to any questions, and estimation of
patient and practitioner satisfaction with the tool. Multi-centre ethical approval was obtained from the Auckland, Otago and Hawkes Bay Ethics Committees (Reference 2001/277).

6.2.2 Evaluation results
In total, 2,543 patients (1000 in Auckland; 1000 in Otago and 543 in Hawkes Bay), 20 urban GPs, 20 practice nurses and 11 GPs were participants in the study. In Auckland, where patients were recruited by a research assistant, 23 patients actively declined to participate (97.75% response rate). In the other centres refusal rate was not recorded because there was no research assistant (practice staff were responsible for conducting the study) but this is not expected to be significantly different from the Auckland rate. Three GPs and two nurses declined to participate (91% practitioner participation rate).

In all three settings the patients were approximately two-thirds female (total 1638/2643; 62%), with an age range from 16 to 91 years, average age of 46 (Auckland and Hawkes Bay) and 49 (Otago). Ethnicity varied markedly among settings. The Auckland sample was ethnically diverse including 68% New Zealand European, 7% Māori and 15% Pacific people. In Hawkes Bay 62% were New Zealand European and the remainder almost exclusively Māori (33%). In comparison, in Otago 93% were New Zealand European.

Thirty-four per cent (182/543) of Hawkes Bay patients admitted to being cigarette smokers compared with 22% (221/1000) of Auckland patients (p=0.0002). Otago patients were similar to Auckland (198/994, 20%). Of those who smoked, 16% (86/548) in Hawkes Bay smoked over 10 cigarettes per day compared with 90/999, 9% in Auckland and 97/999, 9.75% in Otago. Fewer Auckland patients (701/999, 70%) than Hawkes Bay (450/538, 83.6%) and Otago (834/994, 83.9%) patients used alcohol, but an equal percentage (12%) drank four or more times a week in each setting.

The numbers of those who gave positive responses to the case-finding questions are presented in Table 6-1. This is effectively the questionnaire, excluding questions on quantity/frequency of smoking and drinking. The N for Auckland for all questions was 1000. However the denominator varied between questions in the sample from Otago (ranged from 965 to 1000) and from Hawkes Bay (ranged from 520 to 536). These missing data can be attributed to the fact that there was no on-site research assistant in Otago or Hawkes Bay to assist with data collection.

The prevalence of risk factors identified ranged from 43% for depression and 40% for anxiety down to 11% for concerns about drinking to 3% for gambling and other drug use. Three times as many (15%) admitted to trouble with anger control as those who identified trouble with being abused (5%) across all regions.
### Table 6-1 Positive Responses to CHAT Questions

<table>
<thead>
<tr>
<th></th>
<th>Auckland</th>
<th>Otago</th>
<th>Hawkes Bay</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you ever feel the need to cut down on your smoking?</td>
<td>82/500 (16.4)</td>
<td>168/1000 (16.8)</td>
<td>161/536 (30)</td>
<td>441/2036 (20.2)</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down on your drinking?</td>
<td>123/1000 (12.3)</td>
<td>106/1000 (10.6)</td>
<td>41/506 (8.1)</td>
<td>270/2506 (10.8)</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down on your other drug use?</td>
<td>12/1000 (1.2)</td>
<td>39/1000 (3.9)</td>
<td>21/536 (3.9)</td>
<td>72/2536 (2.8)</td>
</tr>
<tr>
<td>Have you sometimes felt unhappy or worried after a session of gambling?</td>
<td>24/1000 (2.4)</td>
<td>37/1000 (3.7)</td>
<td>19/536 (3.7)</td>
<td>80/2519 (3.2)</td>
</tr>
<tr>
<td>During the past month have you often been bothered by feeling down, depressed or hopeless?</td>
<td>436/1000 (43.6)</td>
<td>446/992 (45)</td>
<td>198/536 (36.9)</td>
<td>1080/2528 (42.7)</td>
</tr>
<tr>
<td>During the past month have you often been bothered by having little interest or pleasure in doing things?</td>
<td>326/1000 (32.6)</td>
<td>350/978 (35.8)</td>
<td>128/529 (24.2)</td>
<td>804/2507 (32)</td>
</tr>
<tr>
<td>Have you been worrying a lot about everyday problems?</td>
<td>441/1000 (44.1)</td>
<td>414/965 (42.9)</td>
<td>143/520 (27.5)</td>
<td>998/2485 (40.2)</td>
</tr>
<tr>
<td>Is there anyone in your life whom you are afraid of, who hurts you in any way or prevents you doing what you want?</td>
<td>57/1000 (5.7)</td>
<td>43/979 (4.4)</td>
<td>30/530 (5.6)</td>
<td>130/2509 (5.2)</td>
</tr>
<tr>
<td>Is controlling your anger sometimes a problem for you?</td>
<td>160/1000 (16)</td>
<td>147/975 (15.1)</td>
<td>79/532 (14.8)</td>
<td>386/2507 (15.4)</td>
</tr>
<tr>
<td>As a rule, do you (not)* do at least 30 minutes of moderate or vigorous exercise (such as walking or a sport) on 5 or more days of the week?</td>
<td>449/1000 (44.9)</td>
<td>395/981 (40.3)</td>
<td>243/534 (45.5)</td>
<td>1087/2515 (43.2)</td>
</tr>
<tr>
<td>Are you (un)*happy with your current weight?</td>
<td>388/1000 (38.8)</td>
<td>421/970 (43.4)</td>
<td>218/531 (45.9)</td>
<td>1027/2501 (41.1)</td>
</tr>
</tbody>
</table>

* The actual question asked was asked in the positive, but the inverse is reported to facilitate clarity of comparison with other risk factors.

Table 6-2 shows the numbers who wanted assistance with specific problems. These were similar across regions hence only the totals are presented for clarity for those who wanted help either at that consultation or at a later date.
Few patients with positive responses requested help for the identified problem – only 15% for depression and anxiety, 8.6% for smoking down to 3.5% for anger, 1.4% for alcohol, 2.2% for abuse, 0.8 for drug misuse and only 0.5% for gambling.

Table 6-2 Responses Requesting Help with Identified Issue on the CHAT

<table>
<thead>
<tr>
<th>Patient wanting help from doctor or nurse with specific problems</th>
<th>No</th>
<th>%*</th>
<th>Yes but not today</th>
<th>N</th>
<th>%*</th>
<th>Yes, today</th>
<th>N</th>
<th>%*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>1946 / 2133</td>
<td>91.2</td>
<td>119 / 2133</td>
<td>5.6</td>
<td>68 / 2133</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>2114 / 2143</td>
<td>98.6</td>
<td>19 / 2143</td>
<td>0.9</td>
<td>10 / 2143</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other drugs</td>
<td>2055 / 2072</td>
<td>99.2</td>
<td>9 / 2072</td>
<td>0.4</td>
<td>10 / 2072</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gambling</td>
<td>2050 / 2061</td>
<td>99.5</td>
<td>6 / 2061</td>
<td>0.3</td>
<td>5 / 2061</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>1857 / 2127</td>
<td>87.3</td>
<td>117 / 2127</td>
<td>5.5</td>
<td>153 / 2127</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>1851 / 2139</td>
<td>86.5</td>
<td>139 / 2139</td>
<td>6.5</td>
<td>149 / 213</td>
<td>7.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abuse</td>
<td>1962 / 2007</td>
<td>97.8</td>
<td>22 / 2007</td>
<td>1.1</td>
<td>24 / 2007</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>1935 / 2005</td>
<td>96.5</td>
<td>44 / 2005</td>
<td>2.2</td>
<td>26 / 2005</td>
<td>1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td>1992 / 2007</td>
<td>95.8</td>
<td>57 / 2007</td>
<td>2.8</td>
<td>28 / 2007</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1838 / 2016</td>
<td>91.2</td>
<td>105 / 2016</td>
<td>5.2</td>
<td>73 / 2016</td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Because results were very similar across all 3 regions only findings for total number of patients are presented for the sake of clarity

Those who objected to being asked specific questions are presented in Table 6-2. There was minimal (<1%) objection to the screening questions, ranging from 0.8% objecting to being asked about their drug use down to 0.1% objecting to the question on physical activity.

Feedback from both patients and practitioners on the tool was overwhelmingly positive. Most patients liked using it, and found it clear, short, quick and easy to complete. Some commented that it was ‘non-threatening’; made them aware of lifestyle practices that might impact on their health; and gave them options regarding seeking help. Ninety-three (3.6%) patients recorded negative comments, which were generally either that the questions were too personal or too vague, while others were concerned that issues such as diet, employment difficulties or allergies were omitted.
Table 6-3 Questions Patients Objected to being Asked Questions on the CHAT

<table>
<thead>
<tr>
<th>Objection</th>
<th>Auckland* N = 1000</th>
<th>Otago† N = 1000</th>
<th>Hawkes Bay‡ N = 543</th>
<th>Total patients N = 2.543</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (% )</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Objected to any question</td>
<td>8 (0.8)</td>
<td>24 (2.4)</td>
<td>24 (4.4)</td>
<td>56 (2.2)</td>
</tr>
<tr>
<td>Smoking</td>
<td>1 (0.1)</td>
<td>3 (0.3)</td>
<td>5 (0.9)</td>
<td>9 (0.3)</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1 (0.1)</td>
<td>4 (0.4)</td>
<td>8 (1.5)</td>
<td>13 (0.5)</td>
</tr>
<tr>
<td>Other drugs</td>
<td>4 (0.4)</td>
<td>5 (0.5)</td>
<td>13 (2.4)</td>
<td>22 (0.8)</td>
</tr>
<tr>
<td>Gambling</td>
<td>0 (0)</td>
<td>5 (0.5)</td>
<td>10 (2.2)</td>
<td>15 (0.6)</td>
</tr>
<tr>
<td>Depression</td>
<td>0 (0)</td>
<td>1 (0.1)</td>
<td>7 (1.3)</td>
<td>8 (0.3)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1 (0.1)</td>
<td>4 (0.4)</td>
<td>5 (0.9)</td>
<td>10 (0.4)</td>
</tr>
<tr>
<td>Abuse</td>
<td>0 (0)</td>
<td>4 (0.4)</td>
<td>6 (1.1)</td>
<td>10 (0.4)</td>
</tr>
<tr>
<td>Anger</td>
<td>0 (0)</td>
<td>3 (0.3)</td>
<td>4 (0.7)</td>
<td>7 (0.3)</td>
</tr>
<tr>
<td>Exercise</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>3 (0.6)</td>
<td>3 (0.1)</td>
</tr>
<tr>
<td>Weight</td>
<td>1 (0.1)</td>
<td>2 (0.2)</td>
<td>6 (1.3)</td>
<td>9 (0.3)</td>
</tr>
</tbody>
</table>

*Auckland* No patient objected to more than one question
†Dunedin 9 patients objected to more than one question
‡Hawkes Bay 3 patients objected to every question; all objectors objected to more than one question

Several patients gave feedback on the layout of the tool, which resulted in design changes to increase its clarity.

The tool was also well-received by practitioners. Overall, doctors (n = 31) were more positive than nurses (n = 20), with all but three (one urban, two rural) doctors saying they would use it in their practice. All those who would use it would like it in electronic form, with half of these wanting dual (electronic and paper) formats. Options for use included using the tool with all new adult patients, all casuals, screening all patients in the waiting room for one month each year or screening all patients once every one, two or three years. Seventy-five per cent of the nurses also said they would use the tool. The five who would not were those who had filled in the form for patients, rather than allowing them to self-complete.

6.2.3 Discussion on evaluation of the CHAT

This is the first multi-item lifestyle and mental health screening questionnaire in the literature. It was very acceptable to patients in both urban and rural settings. For example, only 0.4% (10/2543) of patients objected to the question on abuse, and this included three patients who objected to every question. This compares very favourably with other screening studies, where 15 to 57% of female patients objected to being asked about abuse.29-40
These findings indicate that more than 99% of all adult patients in a New Zealand general practice setting will complete a self-administered generic questionnaire requesting sensitive information on lifestyle and mental health issues without patient objection. Less than 1% of patients objected to being asked any of the questions, with the greatest number of objections to the question on other drugs such as cannabis use (0.8%). Given the illegal nature of this behaviour, this is not surprising. This raises the issue of patient honesty with respect to self-reporting of such behaviours. Under-reporting may be an issue, given that responses were not anonymous to patients’ practitioners. However some studies comparing self-reporting of alcohol and drug use with blood alcohol measures, and blood or urine testing for other drugs, have found self-reporting consistent with the biological markers, although these studies were not necessarily conducted within the primary care setting.311-313

Generally, findings were similar between urban and rural populations, and between doctor and practice nurse patients. The tool was acceptable to most general practitioners and nurses, who found it simple to use. The small number of practice nurses who were less enthusiastic were those who interviewed the patients to collect feedback information about screening and commented that this was time-consuming. However as a self-administered questionnaire without the research feedback component, this issue would not arise.

The questions on depression and anxiety yielded high response rates, with some respondents requesting assistance. It is not known whether these were newly detected problems or whether patients’ consultations were for on-going care of these pre-existing conditions. This result led to a study to determine whether those requesting help are those with moderate or severe depression in greatest need of intervention, which is reported later in this thesis. Initial fears that doctors would be inundated with requests for help with newly identified lifestyle problems, in addition to the scheduled consultation, were not realised. Having identified a problem, patients had the option to state that they did not wish to deal with it today. For those that did identify a problem for which they wanted help today, the doctor had the option of either dealing with it if time allowed, or scheduling another appointment for it. To our knowledge this is an innovative approach not utilised in other tools, and may help gauge patients’ willingness to address the problem areas.310 The highlighting of a lifestyle risk factor such as smoking in a patient who does not want help still allows for a brief intervention - acknowledging that the patient smokes and advising that help is available should it be required in the future.

A strength of this evaluation was the large sample size conducted with consecutive adult patients with concurrent assessment of the acceptability of the tool. We chose to test the tool in three different settings to assess its usefulness across a broad range of patient ages, ethnicity and sociodemographic circumstances and with both rural and urban general practitioners and practice nurses. The items chosen are predominantly those expected to be of interest and
relevance in general practice (such as smoking, alcohol use, depression, physical activity) plus several for which there are significant associated health sequelae (for example gambling and exposure to violence). There is growing demand for these to be addressed within primary care settings.\textsuperscript{41,65,314} However a weakness in this tool is that, while there is a general expectation and sometimes ministerial directive that GPs identify and manage mental health disorders such as anxiety, and social problems such as gambling and domestic violence, some of these problems currently do not meet international guidelines for screening.\textsuperscript{4}

The CHAT consists of a number of brief screens, some of which have been validated under different conditions - for example the two-question depression screen.\textsuperscript{245} While there have been a number of mental health and lifestyle screening tools developed for general practice, either for single or multiple issues (for example, conjoint screening for alcohol and other drugs\textsuperscript{101}) there is no alternative tool offering brief screening for a broad range of mental health and lifestyle behaviours relevant to general practice. If good coverage is intended, gathering this information opportunistically is not feasible. A limitation of the findings is that they are derived from the development of a multi-item tool and assessment of the feasibility and acceptability of its use. As the composite tool had not been validated, care needed to be taken in interpreting the findings of prevalence of various risk factors and conditions.

It was planned for the entire screening questionnaire to undergo a validation exercise against appropriate reference standards for each condition. This validation study is reported later in this thesis. Once validated for use in NZ primary health care, it was envisaged that paper versions would be made available, and electronic versions integrated into patient management software. Ideally, a positive response should lead seamlessly to a more comprehensive screening or diagnostic tool – for example, access to the full version of the AUDIT, a validated 10-question screening tool for problematic drinking. A number of our screened conditions do not yet meet WHO criteria for screening (for example, there are no randomised controlled trials of effective treatment for gambling). Future research may involve assessing the treatment for some of these conditions. We had concerns about the utility of our weight questions and we decided our amended tool would use the weight screening question from the Primary Care Evaluation of Mental Disorders (PRIME-MD),\textsuperscript{37} a screening instrument developed using diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV). The full PRIME-MD has limited clinical usefulness due to its lengthy administration time.\textsuperscript{286}

In summary, general practice is highly accessible to patients requiring help with problem behaviours, and patients expect to receive preventive lifestyle advice from their general practitioner, but given consultation time restraints, adherence to routine screening regimes can be low for both patients and practitioners. The first brief multi-issue self-administered screening tool for lifestyle risk factors and mental health issues for use in primary health care, this tool proved very acceptable to large sample of consecutive adult patients. General practitioners and
practice nurses were not overwhelmed with requests for help in addition to the scheduled consultation issues. Asking if assistance is required is an innovation that may gauge patients’ readiness to change their behaviour. This tool is promising and goes some way to meet demands for screening lifestyle and mental health issues in primary health care.

6.3 Ethnic variations

We conducted a study using the CHAT to determine ethnic differences in lifestyle risk factors and mental health in primary care patients.6 My co-authors in this paper were Professor Bruce Arroll, Department of General Practice & Primary Health Care, Dr Nicole Coupe, then located at Tomaiora (Māori & Pacific Health Research), Department of Māori & Pacific Health, University of Auckland and Associate Professor Stephen Buetow, Department of General Practice & Primary Health Care, University of Auckland.

For some people, asking about sensitive lifestyle behaviours is embarrassing or objectionable. In developing the CHAT we anticipated that generic screening for several potentially sensitive issues would reduce the likelihood of people feeling ‘singled’ out and offended, and hence would enable them to feel comfortable providing this information. As well as aiming to determine any ethnic differences between Māori, Pacific Island people and NZ Europeans in their felt needs to address any problem areas identified by the CHAT, this aspect of the evaluation also aimed to look at any ethnic differences in the rate of objection to specific questions.

6.3.1 Method of evaluation for ethnic variations

In the evaluation of the Auckland patients described in Section 6.2, 50 consecutive patients from 20 randomly selected general practices self-identified their ethnicity on the form, using the standard 2001 Census format. Those identifying with multiple ethnicities were allocated a single ethnicity on the basis of the priority system of Statistics New Zealand.315 For example, a patient identifying as Māori and NZ European was classified as Māori.

CHAT forms were completed by patients before their consultation, either by themselves in the waiting room or with assistance. Where patients identified issues they wanted addressed, practitioners could either deal with the problem immediately or reschedule a further consultation. All patients and practitioners completed feedback forms, which elicited their positive and negative responses to the tool and recorded any objections to the questions asked. Data from this feedback were used to determine the acceptability and feasibility of use of the tool.

Data included demographic information; positive responses to each screening question; number of patients requesting assistance from their doctor or nurse concerning risk factors; patients’
objections to questions; and estimation of patient and practitioner satisfaction with the resource. For each lifestyle issue, we calculated differences, by ethnicity, between the proportions of patients requesting assistance from their doctor. Using the STATA V7 statistical software package, the confidence intervals were adjusted for clustering within general practices. This adjusted for the possibility that patients within individual practices are more likely to respond in a similar manner than are patients in different practices.

6.3.2 Results of evaluation for ethnic variations

A total of 1000 consecutive Auckland patients from 20 GPs participated in the study. The practitioner participation rate was 87% (20/23). The patient response rate was 98% (1000/1023).

The sample was 67.6% NZ European; 7.1% Māori; 14.4% Pacific Island people and 10% ‘other’, with 1% missing ethnicity data. According to the New Zealand Census, the Auckland region population in 2001 was about 68% NZ European; 10% Māori and 14% Pacific Island people. The gender of patients was approximately two-thirds female with an age range from 16 to 91 (mean of 47 years). The gender balance of patients was similar for NZ European, Māori and Pacific Island people (between 67.0% and 67.8% female).

Taking clustering into account, no significant differences were found between NZ European and Māori in their responses to the screening questions (Table 6-4). At the 5% level of statistical significance, NZ European and Pacific Island people differed with respect to their expressed exposure to abuse and their difficulty controlling anger.

Overall, only a small percentage of people who responded positively to the screening questions signalled they wanted help with these problems (Table 6-5).

Māori were significantly more likely than New Zealand Europeans to indicate they would like help with cutting down their alcohol consumption. Pacific Island people were similar to New Zealand Europeans in their expressed interest in receiving help with specific problems. The questions on depression and anxiety yielded high positive responses, some of whom requested assistance. It is not known whether these were newly detected problems or whether patients’ consultations were for on-going care of these pre-existing conditions.
### Table 6-4 Comparison of NZ European with Māori and Pacific Island People Responses

<table>
<thead>
<tr>
<th></th>
<th>NZ Europeans</th>
<th>Māori</th>
<th>Absolute difference</th>
<th>Pacific Islanders</th>
<th>Absolute difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
<td>(95% CI)</td>
<td>(%)</td>
<td>(95% CI)</td>
</tr>
<tr>
<td>Need to cut down smoking</td>
<td>14.7 (57/389)</td>
<td>37.0</td>
<td>22.4 (-48.1, 92.9)</td>
<td>18.2 (6/33)</td>
<td>3.5 (-38.7, 45.7)</td>
</tr>
<tr>
<td>Need to cut down alcohol</td>
<td>11.2 (76/676)</td>
<td>8.5</td>
<td>2.8 (-6.9, 12.5)</td>
<td>14.6 (21/144)</td>
<td>3.3 (-4.2, 10.8)</td>
</tr>
<tr>
<td>Need to cut down other drug use</td>
<td>1.1 (7/628)</td>
<td>0</td>
<td>1.1 (-3.4, 5.6)</td>
<td>2.9 (4/139)</td>
<td>1.8 (-15.0, 18.6)</td>
</tr>
<tr>
<td>Unhappy after gambling</td>
<td>1.9 (13/674)</td>
<td>4.2</td>
<td>2.3 (-3.0, 7.6)</td>
<td>3.5 (5/144)</td>
<td>1.5 (-1.6, 4.6)</td>
</tr>
<tr>
<td>Depression (both questions)</td>
<td>24.4 (164/673)</td>
<td>26.1</td>
<td>1.7 (-16.8, 20.2)</td>
<td>26.4 (38/144)</td>
<td>2.0 (-12.9, 16.9)</td>
</tr>
<tr>
<td>Anxiety: worrying about everyday problems</td>
<td>40.4 (272/674)</td>
<td>47.1</td>
<td>6.8 (-22.7, 36.2)</td>
<td>56.2 (81/144)</td>
<td>15.9 (-1.9, 33.7)</td>
</tr>
<tr>
<td>Abuse: hurt, threatened, controlled</td>
<td>4.4 (30/675)</td>
<td>5.9</td>
<td>1.4 (-4.4, 7.2)</td>
<td>11.3 (16.141)</td>
<td>6.9 (1.4, 12.4)</td>
</tr>
<tr>
<td>Problem controlling anger</td>
<td>12.0 (81/676)</td>
<td>22.5</td>
<td>10.6 (-12.4, 33.6)</td>
<td>29.2 (42/144)</td>
<td>17.2 (1.6, 32.8)</td>
</tr>
<tr>
<td>Physically inactive</td>
<td>53.5 (361/675)</td>
<td>52.1</td>
<td>1.4 (-14.4, 17.2)</td>
<td>58.3 (84/144)</td>
<td>4.9 (-9.3, 19.1)</td>
</tr>
</tbody>
</table>

The screening tool was accepted very well by patients, with a minimal (<1%) objection rate to any of the questions. The greatest objection was to the question on recreational drug use (0.8%). There were no ethnic differences in the acceptance of the tool.
6.3.3 Discussion on evaluation of ethnic variation

This is the first study to look at differences between NZ European, Māori and Pacific Island patients’ responses in primary care to screening questions on these combined risky lifestyle behaviours and mental health issues, although a 1989 epidemiological study has looked at the national prevalence of mental disorders including substance abuse. The 2006 NZ Mental Health Survey compared Maori, Pacific Island and Other ethnicity for 12-month prevalence of mood, anxiety and any substance use disorders.

After adjustment for clustering by practitioner, Pacific Island patients expressed more concerns than New Zealand Europeans about being abused and expressing their anger. No other ethnic differences were found in patients’ expressed need to reduce their own lifestyle risk factors. This is despite ethnic differences in prevalence of risky lifestyle behaviours such as smoking and drinking, although such data are limited for general practice patients. The study reports...
findings in relation to ethnic differences and further validates a new collection of screening questions for use in primary care by establishing its “acceptability”.

Ethnic differences are known to characterise the prevalence of risky lifestyle behaviours such as smoking and drinking, but such data are limited for general practice patients. Community-wide, Māori compared with non-Māori have an increased risk of smoking, hazardous use of alcohol, use of cannabis, problem gambling, and being victims of violence. Māori are also more likely to be sedentary than New Zealand European and other ethnic groups.

Information on the use of mental health and related services indicates that Māori have more mental health problems than the general population. Māori also have increased rates of hypertension, combined cardiovascular risk factors, diabetes and obesity.

In 1994 Pacific Island people were identified as the fastest and youngest growing population in NZ with a large percentage aged under 20 years. There are less data for some of these issues, such as recreational drug use, with respect to Pacific peoples. Given the growing number of youth, they warrant attention with respect to risky lifestyle behaviours and mental health issues. Pacific smokers report that they smoke less heavily compared with NZ European or Māori smokers. However, smoking is a leading cause of disability adjusted life years (DALYs) lost among Pacific males. Pacific people overall are less likely to drink alcohol than NZ Europeans, but those who do drink tend to drink more on a typical day when drinking than NZ European drinkers. Pacific people are more than twice as likely to have been diagnosed with diabetes than NZ European people, and diagnosed at a younger age.

Certain population groups have higher problem gambling prevalence rates. Māori and Pacific peoples are over-represented with respect to access to treatment services, and youth as a population group are becoming more visible in problem gambling studies.

Only a small percentage of patients admitting to a particular problem requested professional help with it. With issues such as gambling, patients noted on their feedback evaluation forms that they did not realise that this was a problem for which they could seek help from their GP. Previous research has indicated that structural characteristics of services such as cost, times open, and travel distance are seldom reasons for not seeking care for mental health problems; rather reasons were mainly attitudinal, such as believing they should be strong enough to cope without professional help. Even in circumstances where patients do have positive lifestyle risk behaviours but do not indicate they want help to change, the practitioner still has the opportunity to raise the issue. For example, the GP could acknowledge “I see that sometimes you feel the need to cut down on your drinking but right now you are not seeking help with this” and then explain that if at some stage the patient does want assistance, a number of possible interventions are available. Patients with gambling problems may not see this as an issue with which the GP can help. This allows pre-contemplative patients (patients not yet ready to make...
changes) the chance to return to address issues should they contemplate behaviour change at a later date.

Mason Durie has identified that Māori rates of mental illness have been increasing since 1975, and that Māori have a different profile to non-Māori as far as mental illness is concerned. There are a number of reasons for this including late presentation for treatment. The te Puāwaitanga Māori Mental Health National Strategic Framework identifies that ‘primary, early intervention and mental health services need to be more accessible and appropriate to the needs of Māori to mitigate entry of Māori into crisis and forensic services.’

International indigenous youth suicide literature introduces the concept of cultural depression, considered to be related to trying to live in two worlds but fitting in neither, coupled with a history of cultural destruction over which indigenous peoples had no control. The anger identified by Māori patients may be a reflection of contemporary Māori society's loss of power over their destiny and / or as a marker of poverty.

A limitation of the study is that it does not demonstrate what additional knowledge is gained over what the GP or practice nurse already knows about the patient. Some of the needs expressed by individual patients may already be known to their health care providers or be self-limiting. Nevertheless, in contributing to an assessment of ethnic differences in patient-defined health needs, this study indicates that Pacific peoples warrant particular attention with respect to at least two risky lifestyle behaviours and mental health issues: being abused and expressing anger. A further caveat is that when people report more than one ethnicity, the priority system for coding them to one ethnic group gives special priority to Māori and, to a lesser extent, Pacific Island people. This loses detail and makes assumptions, which may be false, about the ethnic group with which people most strongly identify. Nevertheless, the priority system is one of the ways used by Statistics New Zealand to report ethnic data.

Systematic screening of primary care patients may uncover lifestyle and mental health problems, which some patients would like addressed. While in some practices the GP may already know lifestyle details and mental health issues of their patients, in our research experience screening may increase the practice workload. Possible solutions include providing for a subsidised or free extra consultation (as is now available under some Primary Health Organisation (PHO) protocols) or having a trained and dedicated person available. This could be a GP, practice nurse or a primary mental health co-ordinator who has appropriate brief intervention and problem-solving skills; can provide relevant patient education including the use of written resources, and has knowledge of appropriate referral agencies and individuals for patients requiring external referral. Telephone monitoring has been shown to enhance the effectiveness of management of depression and has been advocated as a model for serving vulnerable populations, to co-ordinate and integrate community services.
A primary mental health co-ordinator could work with the individual and family and assist them to acquire social supports they may lack. It is important that any intervention is culturally appropriate and meets the needs of the ethnic populations served by a practice. This might include translated resources or referral to suitable external providers.

6.4 Evaluation of co-existing lifestyle and mental health issues with problematic gambling

The multi-item nature of the CHAT allows for evaluation of co-morbidities. We assessed the co-occurring lifestyle and mental health issues in the primary care patients who reported concerns about their gambling. My co-investigators in this work were Professors Bruce Arroll and Ngaire Kerse from the Department of General Practice & Primary Health Care, University of Auckland; Dr Sean Sullivan from Abacus Counselling & Training Services Ltd, Auckland; Dr Nicole Coupe (Kai Tahu), then located at Tomaiora (Māori & Pacific Health Research), Department of Māori & Pacific Health, University of Auckland; Associate Professor Samson Tse, then Director of the Centre for Gambling Studies, School of Population Health, University of Auckland and Dr Robin Shepherd, Dr Fiona Rossen and Dr Lana Perese, Section of Social and Community Health, School of Population Health, University of Auckland.

6.4.1 Introduction to evaluation of problem gambling co-morbidity

As available opportunities for gambling increase, it appears that problem gambling is increasing in prevalence. As well as impacting on an individual’s health and well-being, problematic gambling may have serious harmful effects on the patient’s family, financial security and career. GPs are often the first in the line to identify these problems and to provide a proper referral but problem gambling may go undetected during a standard consultation.

It is well known that comorbidity is linked with problem gambling and this link is bidirectional. Patients with gambling disorders in treatment centres have been shown to have high rates of comorbid use of tobacco, problem drinking, other substance misuse and mood disorder. This pattern has been widely supported worldwide mainly from treatment populations of problem gamblers, substance abusers, or psychiatric cohorts. Within the general population, a link is reported between problem gambling and ‘hazardous use of alcohol’ as well as weaker associations between problem gambling and minor mental disorders and with substance abuse and psychiatric illness amongst young people. Overall studies support the supposition that there is a link, albeit a weaker one, in the general population compared to treatment settings.
Comorbid conditions and problem gambling should not be viewed as discrete disorders, particularly when these individuals engage in treatment. Some problem gamblers will binge on alcohol if they do not have the resources to gamble. Those with dual disorders may engage in other addictive behaviours such as alcohol or drug abuse when recovering from gambling, or relapse with gambling if they are also abusing substances.

For individuals with gambling and related comorbidity, the intensity of the problem fluctuates. Many do not completely recover from these problem behaviours. For example, women casino employees were able to decrease their problem drinking symptoms over a three year time frame, but they continued to gamble problematically. Furthermore, many problem gamblers suffer from medical problems such as insomnia, irritable bowel syndrome, peptic ulcer, hypertension, migraines, and other stress-related problems and may present with these to their rather doctor rather than with a gambling problem per se.

The aim of this evaluation was to compare the group of screened NZ general practice patients who identified concerns with their gambling behaviour with the total population of screened patients in relation to co-morbidity of other lifestyle risk factors and mental health issues.

6.4.2 Method of evaluation of problem gambling co-morbidity

This assessment used the data from the national evaluation of the CHAT tool, involving In total, 2,543 patients (1000 in Auckland; 1000 in Otago and 543 in Hawkes Bay), 20 urban GPs, 20 practice nurses and 11 rural GPs described in 6.2. Practices were randomly selected using a computer-generated random number table.

Data analysis, using descriptive statistics and non-parametric binomial (chi-squared tests and Fishers Exact 2-tailed) was conducted using SPSS-10.0 statistical package. Data included demographic information; positive responses to each screening question and number of patients requesting assistance from their doctor or nurse concerning risk factors. The 79 who screened positive for concerns about gambling (answered yes to “Do you sometimes feel unhappy or worried after a session of gambling?”) were compared with the total patient population (2536) with respect to their responses to other screening factors. To examine the effects of age, gender, other behaviours on gambling status, a Pearson chi-squared statistic was corrected for the survey design using the second-order correction of Rao and Scott and converted into an F-statistic. Adjusting for clustering by practitioner used STATA survey analysis, \(\chi^2\) and logistic regression (51 clusters). All analyses were done with the group of 79 as cases.
6.4.3 Results of evaluation of problem gambling co-morbidity

A total of 2,536 consecutive patients (1000 in Auckland; 1000 in Otago and 536 in Hawkes Bay), 20 urban doctors, 20 practice nurses and 11 rural doctors (51 practices) participated in the study. In Auckland, where patients were recruited by a research assistant, 23 patients actively declined to participate (97.75% response rate). In the other centres the refusal rate was not formally recorded but research assistants reported it as less than 5%.

Seventy-nine expressed concerns about their gambling (3% of the total). Of these 79, 43 (54%) were female, compared with 67% of the total sample (p = 0.02). Those worried about gambling more likely to be male with an odds ratio (OR) of 1.85 (95% CI 1.1-3.1).

The odds of an individual who was worried about gambling giving a positive response to a CHAT question compared to the odds of all the group giving a positive response to that item are presented in Table 6-6.

The age of the 79 patients ranged from 18 to 89 years with a mean of 43 and SD of 16.3. When age was examined using logistic regression for complex survey data the OR = 0.99 (CI 95% 0.97-0.99) p = 0.035 for each year older – in other words, the older the patient, the less likely to identify as worried about gambling.

Māori (6%, 15/242) were significantly more likely than NZ European (1.55, 15/1002) to be worried about their gambling behaviour (p=0.0002) and were also more likely to want immediate help (p=0.04).6

The group concerned about their gambling were also significantly more likely (all p<0.0001) to have concerns about their smoking, use of recreational drugs, and alcohol (see Table 6-6). Similarly they were more likely to indicate a problem with depression, anxiety and anger control. There was no significant relationship for abuse, physical inactivity or weight concerns.
### Table 6-6 Odds Ratios of Positive Responses to CHAT Questions if Worried about Gambling

<table>
<thead>
<tr>
<th>CHAT question</th>
<th>Total sample N (%)</th>
<th>Worried about gambling n (%)</th>
<th><em>OR</em> (CI 95%)</th>
<th><em>p</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you ever feel the need to cut down on your smoking?*</td>
<td>406 (16)</td>
<td>30 (38)</td>
<td>3.9 (2.12 – 5.44)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down on your drinking?</td>
<td>258 (10)</td>
<td>18 (23)</td>
<td>2.74 (1.64 - 4.55)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down on your other drug use?</td>
<td>68 (3)</td>
<td>9 (11)</td>
<td>5.23 (2.51 - 10.9)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>During the past month have you often been bothered by feeling down, depressed or hopeless?</td>
<td>1081 (43)</td>
<td>53 (67)</td>
<td>2.84 (1.7 - 4.75)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>During the past month have you often been bothered by having little interest or pleasure in doing things?</td>
<td>805 (32)</td>
<td>42 (53)</td>
<td>2.5 (1.67 - 3.81)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Have you been worrying a lot about everyday problems?</td>
<td>997 (39)</td>
<td>46 (58)</td>
<td>2.21 (1.38 - 3.55)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Is there anyone in your life whom you are afraid of, who hurts you in any way or prevents you doing what you want?</td>
<td>130 (5)</td>
<td>3 (4)</td>
<td>0.73 (0.24 - 2.24)</td>
<td>0.57</td>
</tr>
<tr>
<td>Is controlling your anger sometimes a problem for you?</td>
<td>387 (15)</td>
<td>24 (30)</td>
<td>2.52 (1.44 - 4.43)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>As a rule, do you do at least 30 minutes of moderate or vigorous exercise?</td>
<td>1379 (54)</td>
<td>47 (59)</td>
<td>1.24 (0.78 - 1.99)</td>
<td>0.36</td>
</tr>
<tr>
<td>Are you happy with your current weight?</td>
<td>1072 (42)</td>
<td>40 (51)</td>
<td>1.4 (0.88 - 2.25)</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Significant *p* values in bold

Total patients screened N = 2536 (from 51 practices); Patients worried about gambling n = 79 (3%)

* Odds ratio for logistic regression taking into account clustering

A multivariable logistic regression with ‘worried about gambling’ as the dependent variable is presented in Table 6-7. Because the responses to the two depression questions are highly correlated (0.47), only the first depression question was used in the model. The increased odds ratios for other factors for those concerned by their gambling show a risk picture of multiple and independent issues.
Table 6-7 Multivariable Logistic Regression with ‘Worried about Gambling’ as the Dependent Variable

<table>
<thead>
<tr>
<th>Worried about gambling</th>
<th>OR</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need to cut down smoking</td>
<td>2.86</td>
<td>1.83 - 4.47</td>
</tr>
<tr>
<td>Need to cut down other drugs</td>
<td>2.86</td>
<td>1.30 - 6.26</td>
</tr>
<tr>
<td>Depression – feeling down, depressed, hopeless*</td>
<td>2.29</td>
<td>1.21 - 4.35</td>
</tr>
<tr>
<td>Male</td>
<td>1.85</td>
<td>1.11 - 3.07</td>
</tr>
</tbody>
</table>

*Answering 'yes' to 2 depression questions highly correlated (0.47)

Eleven out of the 79 (14%) who identified as having gambling concerns expressed a desire for help, five immediately and six at a later date. Those worried about their gambling were significantly more likely to want help with their smoking, other drug use, depression and anxiety (Table 6-8) but the small numbers means these results may not be generalisable.
<table>
<thead>
<tr>
<th>Table 6-8 Patients Wanting Help with Specific Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes, today</strong></td>
</tr>
<tr>
<td>( ^a \text{All} \ N \ (%) )</td>
</tr>
<tr>
<td>Smoking</td>
</tr>
<tr>
<td>Alcohol</td>
</tr>
<tr>
<td>Other drugs</td>
</tr>
<tr>
<td>Gambling</td>
</tr>
<tr>
<td>Depression</td>
</tr>
<tr>
<td>Anxiety</td>
</tr>
<tr>
<td>Abuse</td>
</tr>
<tr>
<td>Anger</td>
</tr>
<tr>
<td>Exercise</td>
</tr>
<tr>
<td>Weight</td>
</tr>
</tbody>
</table>

Total patients screened \( N = 2536 \); Patients worried about gambling \( n = 79 \) (3%)

\(^a\) All = total number of screened patients, \( N = 2356 \)
\(^b\) G = patients expressing concern about their gambling behaviour, \( n = 79 \)
\(^c\) Significance of difference between all screened patients and those expressing concern about gambling wanting help either immediately or later.

\( \chi^2 = \text{chi squared} \)

### 6.4.4 Discussion about the evaluation of problem gambling co-morbidity

It is not surprising that co-occurring symptoms such as depression, anxiety, and substance use linked with worries about gambling. Data suggest that problem gambling can be associated with non-gambling health problems.\(^{342,343}\) Co-occurring conditions were frequently identified amongst a group of patients concerned with their gambling behaviour, particularly young males.\(^{344}\) It is
estimated that youth and adult problem gamblers in community and clinical settings drink alcohol and consume other legal and illegal substances at several times the average population rates.\textsuperscript{104,345} A US national problem gambling survey found 10% of lifetime pathological gamblers alcohol-dependent compared to 1.1% of non-gamblers.\textsuperscript{346} A significant number of patients concerned about their gambling were more likely to be apprehensive about their smoking, use of recreational drugs and alcohol. Problem gamblers’ rates of smoking have been shown to increase when they gamble.\textsuperscript{347}

Co-occurring rates of pathological gambling and mental disorders have been examined. Pathological gamblers have been shown to be significantly more likely than non-gamblers to suffer from anxiety disorder,\textsuperscript{348} and phobias.\textsuperscript{349} In this study, patients responding yes to the gambling screen commonly also responded positively to the questions about depression, anxiety\textsuperscript{11} and anger control.

It has been reported that moderate to high percentages of adults seeking treatment for pathological gambling have comorbid alcohol and/or substance misuse disorders.\textsuperscript{350-352} In addition, elevated rates of problem and pathological gambling (usually 10% to 20%) are evident among adults seeking professional help for alcohol and other substance misuse/dependence disorders.\textsuperscript{351,353-355} Patients in our study who expressed concerns about their gambling, were also significantly more likely to want help with their smoking, other drug use, depression and anxiety. We have shown that addition of the help question increases the specificity of the two depression questions used in this study from 67% to 89% while maintaining a sensitivity of 96% (see Section 8.2).\textsuperscript{12}

Research suggests that due to issues such as shame and stigma, gamblers are most likely to first seek assistance for gambling-related problems from informal sources of help (their family and friends) and to develop a range of self-help strategies prior to seeking formal (professional) assistance.\textsuperscript{356} It is possible that the distribution of when patients would like help with their gambling could be partially explained by the above preferences of help-seeking.

Major reasons suggested for not seeking treatment are the desire to handle the problem without help, negative attitude related to stigmatisation of addiction problems and embarrassment and pride.\textsuperscript{357} For services to be accessible, they must be sensitive to the target demographics. For example, despite inflated problem gambling rates, some ethnicities\textsuperscript{356,358} and age groups (adolescents)\textsuperscript{359} often do not access mainstream gambling help agencies.

It should be noted that other reasons for a low rate of desire for help with gambling might reflect not having a gambling problem, not identifying a gambling problem that is present, or having a past gambling problem that has been resolved. The latter is less likely however, given that the gambling question is framed in the present tense.
A strength of this study is that it is the first to report co-morbidity in both lifestyle behaviours and mental health issues in a general practice setting. A weakness of this study is that we cannot be specific about the response rates in some of the centres but believe it to be low and unlikely to over-estimate any morbidities. Each question is quite brief however we know from other work that asking for help for depression is associated with a positive predictive value of 48% for major depression. A further limitation is that a single question was used to assess gambling behaviour with no specific timeframe referenced. Furthermore because the question asks about feeling worried or unhappy after gambling, the likelihood of co-occurrence with a generalised anxiety or depressive disorder is increased and a positive response to the question does not necessarily indicate a gambling disorder.

While screening all adults for problem gambling in primary care may not be indicated, case-finding in specific high-risk populations such as patients presenting with depression, anxiety or substance abuse is likely to be of significant benefit.

6.5 Evaluation of the CHAT in Asian language schools

While designed primarily for use in primary care, the CHAT can also be used in other community settings. An evaluation was conducted using the CHAT with students in language schools for international Asian students in Auckland, and these findings compared with responses from patients of the same age range in primary care settings. Associate Professor Samson Tse, the Founding Director of the Centre for Asian Health Research and Evaluation at the School of Population Health, University of Auckland, conducted the evaluation in the language centres, and Professor Bruce Arroll also assisted in this study.

The last decade has seen large numbers of non-resident Asians, especially Chinese, coming to NZ to attend secondary and tertiary educational institutions. The latter are often without family support, and may take advantage of the relative freedom they experience in comparison with the situation in their home country. It was therefore hypothesised that this population might have a high incidence of risky lifestyle behaviours such as substance abuse and problem gambling, and mental health issues such as anxiety and depression.

The aims of this were to present data focused on Asian student's concerns about their smoking, alcohol and recreational drug use, and gambling behaviour and compare these with responses from primary care patients and to report the acceptability of the tool measured by the evaluation in the above settings.
6.5.1 Method of evaluation of the CHAT in Asian language schools

The CHAT was translated into Chinese and Korean and administered to Asian students attending Auckland English language schools. The schools were recruited by Asian Services, Problem Gambling Foundation of New Zealand (PGF) who offered a free workshop on problem gambling to these institutions. This course, entitled ‘Live well; study well’ briefly addressed a number of lifestyle issues but predominantly focused on gambling. At the completion of the workshop students were invited to participate in the study. Those who consented completed the CHAT and the feedback evaluation forms. The students were given the names and contact details of appropriate agencies such as the Problem Gambling Foundation of New Zealand and Lifeline telephone counselling in Chinese should the screening tool raise issues that they would like addressed.

The results of the Asian students and the general practice patients previously assessed were compared. Because the vast majority of the Asian students (218/246, 88.6%) were aged 16 to 25, it was decided also to look at subsets of students and patients aged 16 to 25 years (designated ‘youth’). Data analysis, using descriptive statistics and non-parametric binomial (chi-squared tests), was conducted using the SPSS-10.0 statistical package. Data included demographic information; positive responses to each screening question; number of respondents requesting assistance concerning risk factors; objections to questions, and estimation of respondent and practitioner satisfaction with the resource.

6.5.2 Results of evaluation of the CHAT in Asian language schools

Three language schools accepted the free workshops. The response rate of attending students from the three schools who consented to participate was 94.3% (246/261). A total of 2,543 consecutive patients, 20 urban doctors, 20 practice nurses and 11 rural doctors participated in the initial primary care study. Three general practitioners and two nurses declined participation, giving a 91% practitioner participation rate.

The respondents were 58% male in the Asian student setting and 33% male in the primary care sample. The ethnicity of the Asian students was 87.2% Chinese, 9.3% Korean and 3.5% ‘other Asian’. The ethnicity of the patients varied considerably in the three different primary care settings (see Table 6-9).
<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Auckland</th>
<th>Otago</th>
<th>Hawkes Bay</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ European</td>
<td>68</td>
<td>92.8</td>
<td>62.8</td>
<td>76.7</td>
</tr>
<tr>
<td>Māori</td>
<td>7.2</td>
<td>3</td>
<td>32.8</td>
<td>10.9</td>
</tr>
<tr>
<td>Pacific People</td>
<td>14.6</td>
<td>0.8</td>
<td>0.8</td>
<td>6.3</td>
</tr>
<tr>
<td>Asian</td>
<td>4</td>
<td>0.9</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>6.2</td>
<td>2.5</td>
<td>3.5</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Within the three general practice settings, response rates were similar for nearly all items, with few significant differences between settings. Comparing the Asian students and primary care patients, there was a significant difference between those who felt the need to cut down or stop cigarette smoking (76/239, 31.8% and 441/2036, 20.2% respectively, \( p < 0.001 \)); to cut down on their alcohol drinking (65/222, 29.3% compare 270/2506, 10.8%, \( p < 0.001 \)) and on their recreational drug use (68/238, 26.5% compare 72/2536, 2.8%, \( p < 0.001 \)). Significantly more Asian students also admitted to sometimes feeling unhappy or worried after a gambling session (22/241, 9.1% compare 80/2519, 3.2%, \( p < 0.001 \)), adjusted for clustering.

The questionnaire was well-accepted by both students and patients, with the highest rate of objection being to the question on recreational drug use for both groups (three students (1.2%) and 22 patients (0.9%)). This was to be expected, given that it was the one question asking about an illegal activity. Objections to questions on other issues ranged from 0.4 to 0.8 % for both the student and patient populations.

While the Asian students identified significantly more problems relating to their alcohol and other drug use and gambling behaviour, it is recognised that these are two very different populations of people. In particular, the Asian students are a young population with a mean age of 21 years (range 13 to 42 years), whereas the patients ranged from 16 to 96 years, with a mean age of 47 years (see Figure 6.2).
The mean age for the youth sub-samples aged 16 to 25 years was 20.9 years for Asian students and 20.8 years for patients. Comparing patient youth with older patients (aged over 25 years) the youth identified significantly more problems with smoking (85/295, 28.8% compare 356/1741, 20.4%, \( p = 0.001 \)); drinking alcohol (58/296, 19.6% compare 212/2210, 9.6%, \( p < 0.001 \)) and other drug use (18/294, 6.1%, compare 54/2242, 2.4%, \( p < 0.001 \)). However there was no difference between the youth and older patients regarding gambling concerns (10/296, 3.4%, compare 70/2240, 3.1%, \( p = 0.81 \)).

Comparisons of responses for Asian student and patient youth are presented in Table 6-10. It can be seen that the Asian students had highly significant increased positive responses to feeling the need to cut down on their drinking, recreational drug use and gambling compared to the patients in that age range. There was no significant difference between the Asian and patient youth in the need to cut down on cigarette smoking.

**Table 6-10 Positive Responses to Screening Questions for Asian Students and General Practice Youth Patients**

<table>
<thead>
<tr>
<th></th>
<th>Asian students</th>
<th>GP patients</th>
<th>( p ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feel the need to cut down on smoking?</td>
<td>71/210 (32.9)</td>
<td>85/295 (28.8)</td>
<td>0.23</td>
</tr>
<tr>
<td>Feel the need to cut down on drinking?</td>
<td>60/195 (30.8)</td>
<td>58/296 (19.6)</td>
<td>\textbf{0.005}</td>
</tr>
<tr>
<td>Feel the need to cut down on other drug use?</td>
<td>65/209 (30.1)</td>
<td>18/294 (6.1)</td>
<td>\textbf{&lt;0.001}</td>
</tr>
<tr>
<td>Unhappy or worried after gambling session?</td>
<td>22/211 (10.2)</td>
<td>10/296 (3.3)</td>
<td>\textbf{0.001}</td>
</tr>
</tbody>
</table>
The Asian students were much more likely to identify an item as an issue with which they would like help, either immediately or at a later date (see Table 6-11). Regarding alcohol use, 9.3% wanted help either immediately or at a later date, compared with 2.4% of patients ($p < 0.001$). Eight per cent of students wanted either immediate or later assistance with their recreational drug use, compared with 0.3% of patients ($p < 0.001$) and 6.5% of students wanted help with their gambling, an issue with which none of the patient youth indicated they needed assistance ($p < 0.001$).

**Table 6-11 Youth (aged 16 to 25) Wanting Help for Specific Problems: Asian versus youth subset of NZ population**

<table>
<thead>
<tr>
<th></th>
<th>Yes but not today</th>
<th>Yes, today</th>
<th>Yes today or later</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asian student n (%)</td>
<td>GP patient n (%)</td>
<td>Asian student n (%)</td>
</tr>
<tr>
<td>Smoking</td>
<td>18/216 (8.3)</td>
<td>28/295 (9.5)</td>
<td>7/216 (3.2)</td>
</tr>
<tr>
<td>Alcohol</td>
<td>10/214 (4.7)</td>
<td>6/296 (2.0)</td>
<td>10/214 (4.7)</td>
</tr>
<tr>
<td>Other drugs</td>
<td>9/210 (4.3)</td>
<td>1/294 (0.3)</td>
<td>8/210 (3.8)</td>
</tr>
<tr>
<td>Gambling</td>
<td>10/216 (4.6)</td>
<td>0/294 (0)</td>
<td>4/216 (1.9)</td>
</tr>
</tbody>
</table>

% responding ‘No’ to help = 100% minus (% wanting help not today + % wanting help today)

Given that the Asian students resided in Auckland, Asian student youth (N = 210; 126 males and 84 females) were compared with Auckland patients youth (N=120; 47 males and 73 females), with responses broken down by gender. In this comparison (see Table 6-12) the male Asian student youth had significantly more worries about their cigarette smoking, recreational drug use and gambling than their patient counterparts, and the female students also were significantly more concerned about their gambling and their recreational drug use than the young female patients.
### Table 6-12 Asian Student and Auckland Patient Youth Responses by Gender

<table>
<thead>
<tr>
<th>Feel the need to:</th>
<th>Male youth*</th>
<th>Female youth*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asian students</td>
<td>Auckland patients</td>
</tr>
<tr>
<td>Cut down smoking?</td>
<td>47/122 (38.5)</td>
<td>5/47 (10.6)</td>
</tr>
<tr>
<td>Cut down drinking?</td>
<td>35/122 (27.8)</td>
<td>12/47 (25.5)</td>
</tr>
<tr>
<td>Cut down other drug use?</td>
<td>39/124 (31)</td>
<td>4/47 (8.5)</td>
</tr>
<tr>
<td>Unhappy after gambling?</td>
<td>14/123 (11.5)</td>
<td>1/47 (2.1)</td>
</tr>
</tbody>
</table>

*Aged 16 to 25 years

#### 6.5.3 Discussion of evaluation of the CHAT in Asian language schools

The CHAT was well accepted by both Asian student and patient populations, with less than 1% objecting to any of the questions apart from recreational drug use.

In the patient population, there was no difference in response to the question on problems with gambling between youth and older adults but the youth admitted to significantly more problems with smoking, alcohol and other drugs.

The Asian students as a group admitted to significantly more problems than the patients, but some of this was explained by age. When the youth sub-group (age 16-25) of Auckland patients was compared with Asian students in this same age range, the students of both genders had a significantly greater problem with other drug use and gambling, and male students also identified more concerns about their cigarette smoking than their patient counterparts.

Asian people including students attending Auckland treatment centres for problem gambling are predominantly male.\(^{102}\) That many female Asian students may have a problem with gambling is a situation not previously detected.

Some important caveats should be noted. The students and patients are two very different populations. The administration of the CHAT took place in different contexts. For the students, screening followed a workshop on gambling which may have raised their awareness of this issue, but would not be expected to affect the others. However, even if the student and patient populations are considered too heterogeneous to allow comparison, the stand-alone Asian
student data is cause for alarm. In fact the present results are consistent with the findings from
the literature review on Asian mental health\textsuperscript{362} and the report by the Asian Public Health project
team in Auckland.\textsuperscript{363} A significant minority of the Asian students identified concerns about their
smoking, drinking, drug-taking and gambling behaviours, and many indicated that they would
like help with these problems. Asian students may be more honest, motivated to maintain their
health and wellbeing in a new culture or over-report concerns about these issues. Qualitative
studies are needed to explore these aspects.

It should also be noted that the Asian student population is not a homogeneous group, and only
a minority indicated lifestyle problems. As a whole, \textit{the majority of students study hard, make a
genuine attempt to integrate with the host community, love the people they meet and enjoy their
life experiences in New Zealand}\textsuperscript{364} They make a considerable financial and social contribution
to NZ. In the year to July 2002, the economic impact of international students on NZ was
estimated to be approximately $1.7 billion.\textsuperscript{365} Asian students also provide an opportunity for
developing cross-cultural skills between students and the wider host community.

Nearly 10\% of Asian students identified wanting help with gambling problems (4.7% immediately and 4.7% at a later date). A large per cent also wanted help with their alcohol use (8.1\%) and with their recreational drug use (6.5\%). These high numbers raise concerns. Many young Asian students are sent by their parents to study in NZ. They potentially are a vulnerable population. They may have large disposable incomes; they have sudden access to licenced gambling premises; increased freedom with less or no parental supervision, and they may be relatively isolated and lonely.

We recommend that these students receive appropriate orientation on arrival in NZ with inter-
sectorial co-ordination of immigration, educational and health agencies providing information on
healthy life style choices. Issues around gambling, smoking, alcohol and other drug use should
also continue to be addressed with good support and pastoral care provided by the educational
institutions attended by these students.

In 2002 I conducted a study comparing contraceptive use pre- and post-therapeutic abortion in
1995, 1999 and 2002 in a NZ clinic.\textsuperscript{361} I found a significant decline in pre-conception
contraceptive use, predominantly from increasing numbers of Asian women presenting for
abortion. I speculated that ethnic Chinese women lack adequate contraceptive education,
demonstrate distrust of non-barrier methods, believe men should provide the prophylactic, and
mistakenly believe contraception unnecessary for the first week following menstruation.
Abortion may be used for family planning rather than contraceptive-failure back-up. Young
Chinese arriving in NZ therefore also require immediate sexual health education including
accurate contraceptive information. Liaison between primary health care sectors and policy
makers of immigration and other services assisting overseas students is recommended to provide culturally appropriate education.

6.6 Summary of Chapter 6

The CHAT underwent considerable evaluation. It was found to be practical to use and acceptable to most of the patients, GPs and practice nurses involved in the study. Interest was expressed in an electronic version, especially by the clinicians for whom paper results present a challenge with respect to storing as part of the medical record.

Over 2500 patients were involved in the primary evaluation with patients from randomly selected practices in urban Auckland, a mixture of urban and rural practices in Otago, and 11 practices in rural Hawkes Bay. A study was conducted of the 1000 Auckland patients from the study, of whom 71 were Māori and 144 were Pacific Island people. The CHAT was acceptable to people of all ethnicities evaluated. The results were also analysed to examine co-existing conditions. Although gambling issues were low prevalence, when they did occur they were frequently associated with co-existing depression, anxiety and substance use.

Lastly the CHAT also was evaluated in the community setting of Asian language schools in Auckland, following its translation into Chinese and Korean. Its use was combined with the option of a workshop on lifestyle issues, particularly focused on gambling. This group had a high prevalence of substance use and gambling for which they indicated they would like help. Although developed for primary care, this indicates that the CHAT is useful in community settings as well, especially in vulnerable populations such as young international students.
7.1 Outline of Chapter 7

A test is valid if it measures what it is purported to measure.\textsuperscript{366} Having developed and evaluated the CHAT and assessed its acceptability it was necessary to test its validity. The version of the CHAT which underwent validation testing is reproduced in Appendix A. It was printed double-sided on one A4 sheet of paper. This chapter reports the validation study of the CHAT, Aim 4 of this thesis.\textsuperscript{10} It outlines the reference standards chosen for each domain with justification for these selections, the method used to validate the CHAT, our results and their implications (see Figure 7.1).\textsuperscript{10}

![Figure 7.1 Outline of Chapter 7 - Validation of the CHAT](image)

Dr Nicole Coupe conducted the analysis of CHAT and reference standard data to determine sensitivities and specificities for each domain. Professor Bruce Arroll assisted with the overall
design of the study and Drs Raina Elley, Sean Sullivan and Anne-Thea McGill contributed to the physical activity, gambling and eating domains respectively.

7.2 Face validity of the CHAT

Face validity is the confirmation from a group of experts as to whether this looks like a reasonable measure of the concept as they understand it.\(^\text{366}\) The CHAT was developed over two years by a collaborative process involving a number of researchers and advisors. The membership of this panel provided general practice and primary care clinical and research expertise plus specific proficiencies in all the various fields of interest. Beyond this, advice on the tool was sought from a number of other experts in the various fields (for example, alcohol and drug disorders). This group of experts assessed the CHAT to be a reasonable tool to case-find common and significant problematic lifestyle behaviours and mental illnesses. It can therefore be assumed that the CHAT has face validity.

7.3 Content validity of the CHAT

Content validity checks whether all the items that should be included are included and identifies the relevance of each indicator and criterion. This might be attained through asking experts whether the measure appears to contain all the important concepts, behaviours and elements of the concept, or more formally assessed by observing patients to see behaviours; interviewing them or reviewing records; or basing the instrument on previously reported measures.\(^\text{366}\) Much of the content of the CHAT is based on previously reported measures. The tool was pilot tested with 2543 patients from rural and urban New Zealand general practices.\(^\text{8}\) Assessment and feedback were obtained from 50 consecutive adult patients of randomly selected urban GPs (20); practice nurses (20) and 11 rural GPs (patient n=2543). The tool was amended and refined at each phase in response to patient and practitioner feedback. The patient population was ethnically, geographically and sociodemographically diverse.

The tool was well accepted by patients (objections to specific questions 0.1-0.9%) and practitioners were not inundated with requests for immediate assistance. Most practitioners would use the screening tool once it is available. Patients were offered help for positive risk factors detected by the tool. One study has found that embedding alcohol questions amongst health and lifestyle questions did not improve their acceptability to emergency department patients.\(^\text{367}\) However the CHAT evaluation indicates that a screening tool containing a number of potentially sensitive questions has very good acceptability within the primary care setting.

The questions were easily understood by patients and the qualitative information we obtained indicated that both patients and practitioners saw relevance in the problem condition being screened. These data serve as an indirect measure of the content validity of the tool.
Furthermore, subsequent to this study, the CHAT was used in a number of clinical settings including the general practice of one of the co-authors (BA) for 12 months with no complaints reported.

Content validity checks whether all the items that should be included are included and identifies the relevance of each indicator and criterion. Most of the practitioners (GPs and practice nurses) and the patients providing feedback considered that the tool appeared to contain all the important concepts, behaviours and elements of the concept. A very small minority considered that sexual health might come within the scope of the tool. However the opinion of the team was that screening for such behaviours poses considerable problems. These problems include the difficulties in locating a suitable screening question for sexual health behaviours, a lack of a ‘gold standard’ measure, and a lack of an appropriate brief intervention to promote behaviour change. In addition, the topic was considered to be too sensitive to include on a general screening form. It was therefore decided that questions regarding sexuality, sexual orientation and at-risk sexual behaviours were beyond the scope of the CHAT.

Given that the CHAT is largely based on previously reported measures and has undergone considerable patient, GP and practice nurse assessment, it can be assumed that it has good content validity.

7.4 **Construct validity of the CHAT**

The concept of construct validity pertains to the extent to which the items are closely associated as expected, according to theory. If the item is related as predicted, it has construct validity. This form of validity primarily is used under circumstances in which there is no other measure of the construct under study. It invokes a theoretical construct that describes the relationship between the attribute under study and other attributes. If the relationship of these two measures is shown to be as expected, there is evidence of convergent validity. However if there is no relationship between the two measures there is no way to determine whether the measure or the theory is responsible for or the cause or the findings. Divergent validity will be indicated where items are related to other items with which theory suggests they should not be related. Given the criterion-based validity of the CHAT against a composite reference standard, testing construct validity is not required. However, it should be noted that theory based on existing literature suggests an inter-relationship between many of the items on the CHAT in a negative direction (for example depression with gambling or alcohol misuse) and we have tested the relationship between problematic gambling and other problems.\(^7\)
7.5 Criterion-related validity of the CHAT

Criterion-based validity refers to the ability of each criterion to measure accurately a specific aspect of care. To assess this ability, the criterion is compared with a ‘gold’ or reference standard, an external variable (criterion) that has been demonstrated to be a valid measure of the specific aspect of care. This is the strongest form of validity. The aim of this validation study was to test the criterion-based validity of the CHAT against a composite reference standard.

7.6 Development of the composite reference standard

The CHAT was validated as a single screening tool. An outline of the reference standard for each component follows. While for many of the items the reference standard is a structured diagnostic interview, conducting full interviews for each of the items for every patient would have taken several hours and was not practical in the context of research conducted with patients attending general practice for their primary care consultations. Our approach therefore was to develop a pragmatic reference standard by selecting well used and validated tests. The version of the CHAT that underwent validation testing is reproduced in Appendix A. The aim was to keep the questionnaire as short as possible to facilitate its completion.

7.6.1 Reference standard for smoking (tobacco)

A questionnaire was required to obtain a history of smoking behaviour including both present and past smoking, quantity, duration of smoking and smoking cessation where relevant. As indicated in Section 4.2, self-report measures of tobacco dependence include the 8-question FRQ, the 6-question FTND and the two-question HSI, a 2-question subset of the FTND. Evidence indicates that the HSI is as effective as the longer versions in determining degree of dependence hence the reference standard used the HSI to measure dependency.

7.6.2 Reference standard for drinking (alcohol)

The Alcohol Use Disorders Identification Test (AUDIT) has been well validated and well researched for the identification of hazardous and harmful alcohol consumption – see Section Chapter 1 Using a cut off score of 8 out of a possible 40, the sensitivity and specificity of the AUDIT for identifying hazardous and harmful alcohol use is 92% and 93% respectively. The tool is particularly useful in detecting recent problem drinking. Its other strengths include its brevity; its development within the primary care setting, and its demonstrated freedom from gender and cultural biases. We therefore chose the AUDIT as a suitable reference standard for our screening tool.
7.6.3 Reference standard for other drugs

Our two-question ‘other drug’ screen was measured against the 20-item Drug Abuse Screening Test (DAST).\textsuperscript{19} The sensitivity and specificity of the DAST have been evaluated using the Diagnostic Interview Schedule, with subjects classified according to the presence or absence of any current DSM drug disorder (excluding alcohol and tobacco) – see Section 4.4.\textsuperscript{276}

In another validity assessment the DAST demonstrated internal consistency and temporal stability in psychiatric out-patient settings a sensitivity of 84% and a specificity of 79% using DSM-III-R drug-use disorder diagnosis at the 4 to 5 cut-off point.\textsuperscript{369} The DAST has primarily been used in psychiatric outpatient settings, but given the lack of tools specifically developed for the primary care setting, the DAST has been selected as the best available measure.

Positive responses to the DAST were followed by questions on the nature of the drug(s) and level of use using a 5 point score (once per week or less; more than once a week; once a day; 2-3 times daily; 4 or more times daily).

7.6.4 Reference standard for problem gambling

Our two question screen was measured against the South Oaks Gambling Screen (SOGS) instrument for the identification of problem gambling.\textsuperscript{20} The SOGS has been demonstrated to be reliable and valid with various populations, including general populations (for example, university students and hospital employees) and clinical populations of alcoholics and drug users.\textsuperscript{370}

7.6.5 Reference standard for depression

Given the previous validation exercises that have been conducted with the two screening questions in the CHAT, we used the depression module of the Primary Health Questionnaire (PHQ-9) as the reference standard.\textsuperscript{245,300} As noted in Section 4.6, the PHQ-9 had previously been validated as a self-administered diagnostic tool for depression diagnostic validity comparable to the clinician-administered PRIME-MD.\textsuperscript{286}

7.6.6 Reference standard for anxiety

The reference standard we chose was the Hospital Anxiety and Depression Scale (HADS)\textsuperscript{22} which gives scores for caseness for both anxiety and depression – see Section 4.6). The HADS is a well-established tool that had undergone validation studies in a number of countries and differing clinical settings.\textsuperscript{371,372}
7.6.7 Reference standard for abuse and anger control

The reference standard for assessing abuse or loss of anger control is the Conflict Tactic Scale (CTS-1). As noted in Section 4.7, this is a well-validated scale assessing use of reasoning, verbal aggression and physical violence in resolving conflict within relationships.22 A major advantage of the CTS-1 is the reciprocal nature of its questions. This scale asks of each item whether a person has been subjected to a particular behaviour from another person, and whether he or she has actively engaged in that behaviour against another person. Therefore, the CTS-1 can assess both being subjected to abusive behaviour and the ability to control one’s anger. This scale also can be used generically without specifying the gender or the relationship of the other person. In contrast, most other tools assessing abusive behaviour focus only on male violence against female partners (for example, the Partner Violence Screen (PVS);32 the Woman Abuse Screening Tool (WAST);30,173 the Women’s Experience with Battering Scale (WEB);373,374 the Abuse Assessment Screen (AAS);375 the Index of Spouse Abuse (ISA);376 the Measure of Wife Abuse (MWA);377 the Hurts, Insults, Threatens, Screams (HITS);172 the Psychological Maltreatment of Women Inventory (PMWI);378,379 and the Composite Abuse Scale (CAS),380 which combines items from the CTS, PMWI, ISA and MWA to encompass physical, emotional and sexual abuse of women by their male partners).

The CTS-1 has been criticised as a measure to be used in partner abuse,161 because while epidemiological studies indicate that men and women engage in violent activities towards each other at similar frequencies,161 the CTS-1 does not identify the increased severity, and different intention, motivational context and consequences from violence inflicted by men.381 The Revised Conflict Tactic Scale (CTS-2)287 does address some of these issues including sexual coercion but it does not include items that ask about emotional abuse or intimidation. Given the generic use of our multi-item tool, we considered that the added sexual questions in the CTS-2 are not appropriate for generalised use. Therefore, the CTS-1 was selected as the most appropriate reference standard to assess the validity of the screening questions about abuse in the CHAT. Because the reasoning section of the CTS-1 is not a measure of violence, only the verbal and physical aggression sections of the CTS-1 was used in the reference standard.

In order to assess how well the CHAT questions identify physical, emotional and verbal abuse and threatening behaviour, we used the HITS172 as an additional reference standard comparator. The HITS is a four item tool, which addresses these behaviours more explicitly. The HITS has been tested against the verbal and physical aggression items from CTS-1. Correlation between the HITS and modified CTS scores are reported as 0.85 but no sensitivity and specificity data are available. The HITS has been developed specifically for screening of male partner abuse of their female partners.

We also cross-correlated male and female responses of the HITS and CTS-1 to assess whether the former is an appropriate tool for assessing abuse in contexts other than male to female
partners, given that the CHAT is a generic tool to be used with adults of either gender and that the abuse and anger questions are not specific to partners.

7.6.8 Reference standard for physical exercise
The Auckland Heart Study (AHS) Physical Activity questionnaire has been validated among 113 randomly selected NZ adults. The AHS Questionnaire has also been validated in the primary care setting using a seven-day activity diary and seven-day pedometer record as standard comparison measures (see Section 4.8). However because the AHS is too time-consuming to complete, the alternative Physical Activity Questionnaire - Aerobics Center Longitudinal Study (ACLS) was selected as the reference standard for the CHAT question on physical activity. Validation studies of the ACLS have been undertaken in clinical and general population settings. The ACLS is a similar earlier questionnaire that asks about the extent and duration of various moderate and vigorous activities undertaken. Like the AHS, the ACLS Physical Activity questionnaire calculates physical activity into MET (metabolic cost) scores. One MET represents metabolic rate of an individual at rest (1.6) set at 3.5ml oxygen consumed per kg body mass / min or approximately 1 kcal/kg/h. Comprehensive lists of the energy requirements (MET scores) for specific activities are widely available. The updated MET codes provided by Ainsworth et al, 2000 were used. After coding, a final dichotomous score of physically ‘active’ or ‘inactive’ was calculated from the MET-hours per week expended.

7.6.9 Reference standard for eating disorders
The SCOFF has been validated in the primary care setting and found to have a sensitivity of 84.6% (95% CI 54.6 - 98.1%) and a specificity of 89.6% (86.3 - 92.9%). It has also been compared with the ESP. With a cut-off of two or more abnormal responses, the ESP had a maximised sensitivity at 100% (95% CI 90 - 100) and specificity of 71% (95% CI 0.0 - 0.15).

Therefore we used both the SCOFF and the ESP as reference standards for the CHAT. These tools give scores for binge eating disorder, bulimia nervosa and anorexia nervosa.

7.6.10 Composite reference standard
The composite reference standard is listed in Table 7-1.
<table>
<thead>
<tr>
<th>Risk factor</th>
<th>CHAT questions*</th>
<th>Positive CHAT</th>
<th>Reference standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>How many cigarettes do you smoke every day? and</td>
<td>Yes &gt;10 cigs/day or Yes to 2nd</td>
<td>Heavy Smoking Index (HSI)</td>
</tr>
<tr>
<td></td>
<td>Do ever feel the need to cut down or stop your smoking?</td>
<td>question</td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>Do you feel the need to cut down on your drinking alcohol? and</td>
<td>Yes to either question</td>
<td>Alcohol Use Disorders Identification Test (AUDIT)</td>
</tr>
<tr>
<td></td>
<td>In the last year, have you drunk more alcohol than you meant to?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Other drugs      | Do you ever feel the need to cut down on your non-prescription or recreational drug use? and
|                  | In the last year, have you ever used non-prescription or recreational drugs more than you meant to? | Yes to either question            | Drug Abuse Screening Test (DAST)  |
| Gambling         | Do you sometimes feel unhappy or worried after a session of gambling? and       | Yes to either question            | South Oaks Gambling Screen (SOGS) |
|                  | Does gambling sometimes cause you problems?                                      |                                   |                                  |
| Depression       | During the past month have you often been bothered by feeling down, depressed or hopeless? and
|                  | During the past month have you often been bothered by having little interest or pleasure in doing things? | Yes to either question            | Patient Health Questionnaire – Depression (PHQ-9) |
| Anxiety          | During the past month have you been worrying about a lot of different things?    | Yes                               | Hospital Anxiety & Depression Scale (HADS) |
| Abuse/violence   | Is there anyone in your life of whom you are afraid or who hurts you in any way? and
|                  | Is there anyone in your life who controls you and prevents you doing what you want? | Yes to either question            | Conflict Tactic Scale 1 (CTS-1) and Hurts, Insults, Threatens, Screams (HITS) |

Table 7-1 The Composite Reference Standard used in Validation of the CHAT
<table>
<thead>
<tr>
<th>Risk factor</th>
<th>CHAT questions*</th>
<th>Positive CHAT</th>
<th>Reference standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger</td>
<td>Is controlling your anger sometimes a problem for you?</td>
<td>Yes</td>
<td>Conflict Tactic Scale 1 (CTS-1)23</td>
</tr>
<tr>
<td>Physical activity</td>
<td>As a rule, do you do at least 30 minutes of moderate or vigorous exercise (such as walking or a sport) on 5 or more days of the week?</td>
<td>No</td>
<td>Physical Activity Questionnaire - Aerobics Center Longitudinal Study (ACLS)25</td>
</tr>
<tr>
<td>Eating disorders</td>
<td>Do you often feel that you can’t control what or how much you eat? and Does your weight affect the way you feel about yourself?</td>
<td>Yes to either question</td>
<td>SCOFF213 ESP215</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For each item, patients are asked ‘If yes, do you want help with this?’ with the options ‘Yes’, ‘Yes but not today’ or ‘No’ except for the exercise question, which asks ‘If no, do you want help with this?’

These tools were combined into the reference standard (named the ‘Lifestyle and mood questionnaire’) consisting of 10 A4 pages (5 double-sided sheets). This is reproduced in Appendix B. Attached was a 2-sided list of possible psychotrophic drugs (generic names on one side and possible trade names on the other) – Appendix C. Patients were asked to place a tick next to any medications they might currently be taking from the list, or that their GP had started them on at this consultation. A scoring sheet for the composite standard was compiled.

While many of the individual items in the CHAT have been validated against more comprehensive tools, the CHAT had not been validated as a whole. The aim of the validation study was to conduct a criterion-based validation of the tool against a group of reference standard instruments.

### 7.7 Methodology for validation of the CHAT

The tool was validated in primary healthcare provider practices in a Primary Health Organisation in South Auckland (socio-economically deprived region) and a Primary Health Organisation in the North Shore (socio-economically advantaged region) of Auckland in 2006-2007.10

As discussed above, the reference standards (Table 6.1) were selected with a pragmatic approach. While DSM-IV diagnostic interviews might be ideal, conducting these in combination would have been too time-consuming to be practical in the primary care setting, and requiring
each participant to complete one diagnostic instrument on a random basis would have required a prohibitively large sample size.

All consecutive primary care patients aged 16 years and over attending the practices were invited to complete the CHAT and a composite reference standard. Exclusion criteria were inability to understand English or mental impairment that precluded meaningful participation. Recruitment ceased when 1000 patients had been recruited.

The CHAT and composite reference standard forms were self-administered by patients in the waiting room. There was a research assistant present to assist with consent and collection and they were advised not to look at the screening tool answers when the patients were completing the reference standard. The study was conducted according to the Standards for Reporting of Diagnostic Accuracy (STARD) statement.³⁸⁶ Where the tool detected a risk factor that the patient wanted addressed, the GP could either deal with the problem at the time of the consultation or schedule a later appointment.

The study received ethical approval from the Auckland Ethics Committee Reference AKY/04/267.

Data analysis was conducted using Microsoft Excel. Scores on the reference standards were dichotomised as ‘case’ or ‘not-a-case’. Sensitivities, specificities, positive and negative predictive values and likelihood ratios were calculated using the Center for Evidence Based Medicine on-line statistical calculator (http://www.cebm.utoronto.ca/practise/ca/statscal/).

7.8 Results of validation of the CHAT

There was a 2% decline rate from the 1015 consecutive eligible patients invited to participate. Sets of completed CHAT and reference standard forms were available from 995 patients, although not all CHAT questions and individual reference standard questions were completed by all participants. Response rates ranged from 99.8% for smoking to 79.6% for anger questions (see response rate in Table 6.2). Where response was incomplete, generally the CHAT was completed but not the relevant section of the composite reference standard.

Sixty per cent of the participants were New Zealand European, 16% Māori, 4% Pacific people and 20% Asian or ‘other’ ethnicity. This is relatively representative of the Auckland population with the 2006 Census recording 56.5% identifying as NZ European, 18.9 % as Asian, group, 14.4% as Pacific people and 11.1 % Māori.³⁸⁷

Seventy-one per cent were female, a proportion commonly found in general practice adult attending patient populations. The age distribution was slightly skewed to the older age groups:
21% were aged 16 to 29 years, 37% in the 30 to 49 year old age bracket, and 42% aged 50 years or older.

Sensitivities, specificities and positive (PPV) and negative (NPV) predictive values are recorded in Table 7-2. Sensitivity is the ability of a test to detect the condition or disease (true positive rate). The PPV ranged from 68% for nicotine dependency and 44% for problematic drinking, which were high prevalence conditions (14.7% and 12% respectively) to 1% for physical violence (a low prevalence condition of 0.6%). The NPV were all between 97 and 100%, except for the exercise question, which produced flawed results in all probability due to systematic error.

The positive and negative likelihood ratios, condition prevalence and response rates are reported in Table 7-3. Likelihood ratio incorporates both sensitivity and specificity and is a direct estimate of how much the test result changes the odds of having the condition. The likelihood ratio for a positive result (LR+) tells you how much the odds of the disease increase when a test is positive and the likelihood ratio for a negative result (LR-) tells you how much the odds of the disease decrease when a test is negative.
Table 7-2 CHAT Sensitivity, Specificity, Positive and Negative Predictive Values

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity % (CI)</th>
<th>Specificity % (CI)</th>
<th>PPV % (CI)</th>
<th>NPV % (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine dependency</td>
<td>89 (83-93)</td>
<td>93 (91-94)</td>
<td>68 (61-74)</td>
<td>98 (97-99)</td>
</tr>
<tr>
<td>Alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problematic drinking</td>
<td>81 (73-87)</td>
<td>86 (83-88)</td>
<td>44 (37-51)</td>
<td>97 (96-98)</td>
</tr>
<tr>
<td>Alcohol dependency</td>
<td>94 (73-99)</td>
<td>79 (77-82)</td>
<td>8 (5-12)</td>
<td>100 (99-100)</td>
</tr>
<tr>
<td>Problematic drug use</td>
<td>45 (28-62)</td>
<td>97 (96-98)</td>
<td>33 (21-49)</td>
<td>98 (97-99)</td>
</tr>
<tr>
<td>Problematic gambling</td>
<td>88 (64-97)</td>
<td>97 (96-98)</td>
<td>35 (21-50)</td>
<td>100 (99-100)</td>
</tr>
<tr>
<td>Major depression</td>
<td>96 (87-99)</td>
<td>69 (66-72)</td>
<td>15 (11-19)</td>
<td>100 (99-100)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>88 (80-93)</td>
<td>74 (70-76)</td>
<td>29 (24-34)</td>
<td>98 (97-99)</td>
</tr>
<tr>
<td>Abuse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal abuse CTS</td>
<td>62 (41-79)</td>
<td>95 (93-96)</td>
<td>25 (15-38)</td>
<td>99 (98-100)</td>
</tr>
<tr>
<td>Physical abuse CTS</td>
<td>80 (38-99)</td>
<td>94 (92-95)</td>
<td>1 (0-2)</td>
<td>100 (99-100)</td>
</tr>
<tr>
<td>Victim according to</td>
<td>49 (34-64)</td>
<td>96 (94-97)</td>
<td>4 (2-5)</td>
<td>97 (96-98)</td>
</tr>
<tr>
<td>HITS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal abuse</td>
<td>63 (41-81)</td>
<td>88 (86-90)</td>
<td>12 (1-19)</td>
<td>99 (98-100)</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>50 (15-85)</td>
<td>87 (85-89)</td>
<td>1 (0-1)</td>
<td>100 (99-100)</td>
</tr>
<tr>
<td>Exercise(^1)</td>
<td>26 (22-30)</td>
<td>40 (36-45)</td>
<td>27 (23-32)</td>
<td>39 (35-44)</td>
</tr>
<tr>
<td>Eating disorder</td>
<td>91 (84-95)</td>
<td>67 (64-70)</td>
<td>30 (26-36)</td>
<td>98 (96-99)</td>
</tr>
</tbody>
</table>

CI refers to 95% confidence interval
PPV refers to positive predictive value
NPV refers to negative predictive value
\(^1\)Responses to exercise question meaningless because of many reversed responses
The questions for smoking, problematic drug use, gambling and abuse all had a LR+ greater than 10, which indicates that it is a very good test for “ruling in” the condition. Alcohol dependency and major depression had LR- of less than 0.1 which indicates that it is a very good test for “ruling out” these conditions.

The way the question on physical activity was presented proved problematic. This is the only question where a ‘Yes’ response indicates healthy behaviour (i.e., exercising sufficiently). The reference standard for this question involved detailed accounts of actual activities undertaken (see Appendix C). It became apparent that many responses for this question were reversed – participants answered No to the initial question when the reference standard indicated they were getting more than adequate exercise, and visa versa. Also a number of people who answered Yes then indicated that they wanted help.

While the ‘eating disorder’ questions in the CHAT had good test properties to exclude an eating disorder (NPV 98%; LR- 0.14) there was low LR+ of 2.75, specificity (67%) with 14% ‘prevalence’. Given that less than 5% of primary care patients are likely to meet DSM-IV criteria for eating disorders, it seems apparent that these questions were measuring something significantly broader than an eating disorder per se.
### Table 7-3 Positive and Negative Likelihood Ratios, Condition Prevalence and Response Rate of CHAT items

<table>
<thead>
<tr>
<th></th>
<th>Likelihood ratio of positive test (CI)</th>
<th>Likelihood ratio of negative test (CI)</th>
<th>Prevalence % (+ve RS)</th>
<th>Response rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nicotine dependency</strong></td>
<td>13.13 (10.22-16.87)</td>
<td>0.11 (0.07-0.18)</td>
<td>14.7 (142/963)</td>
<td>99.8</td>
</tr>
<tr>
<td><strong>Alcohol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problematic drinking</td>
<td>5.75 (4.76-6.93)</td>
<td>0.22 (0.15-0.32)</td>
<td>12 (116/967)</td>
<td>97.2</td>
</tr>
<tr>
<td>Alcohol dependency</td>
<td>4.52 (3.80-5.36)</td>
<td>0.07 (0.01-0.50)</td>
<td>1.8 (17/967)</td>
<td>97.2</td>
</tr>
<tr>
<td><strong>Problematic drug use</strong></td>
<td>16.24 (9.34-28.26)</td>
<td>0.57 (0.41-0.79)</td>
<td>3.0 (29/971)</td>
<td>97.6</td>
</tr>
<tr>
<td><strong>Problematic gambling</strong></td>
<td>30.05 (17.71-45.81)</td>
<td>0.13 (0.02-0.23)</td>
<td>1.8 (16/909)</td>
<td>91.4</td>
</tr>
<tr>
<td><strong>Major depression</strong></td>
<td>3.09 (2.76-3.45)</td>
<td>0.06 (0.02-0.23)</td>
<td>5.3 (50/947)</td>
<td>95.2</td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td>3.32 (2.91-3.80)</td>
<td>0.16 (0.10-0.28)</td>
<td>11 (101/927)</td>
<td>93.2</td>
</tr>
<tr>
<td><strong>Abuse</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal abuse</td>
<td>12.27 (7.79-19.32)</td>
<td>0.40 (0.23-0.69)</td>
<td>2.6 (21/794)</td>
<td>79.8</td>
</tr>
<tr>
<td>CTS</td>
<td>13.15 (7.84-22.05)</td>
<td>0.21 (0.04-1.23)</td>
<td>0.6 (5/794)</td>
<td>79.8</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>11.11 (7.08-17-44)</td>
<td>0.54 (0.40-0.72)</td>
<td>4.9 (41/838)</td>
<td>84.2</td>
</tr>
<tr>
<td>CTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Victim according to HITS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anger</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal abuse</td>
<td>5.34 (3.62-7.96)</td>
<td>0.42 (0.23-0.75)</td>
<td>2.4 (19/792)</td>
<td>79.6</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>3.90 (1.44-10.57)</td>
<td>0.57 (0.22-1.53)</td>
<td>0.5 (4/792)</td>
<td>79.6</td>
</tr>
<tr>
<td><strong>Exercise</strong></td>
<td>0.43 (0.36-3.08)</td>
<td>1.83 (1.62-2.08)</td>
<td>46 (401/874)</td>
<td>87.8</td>
</tr>
<tr>
<td><strong>Eating disorder</strong></td>
<td>2.75 (2.46-3.08)</td>
<td>0.14 (0.08-0.24)</td>
<td>14 (127/932)</td>
<td>93.7</td>
</tr>
</tbody>
</table>

*total n = 995

CI refers to 95% confidence interval  
+ve RS refers to positive reference standard  
CTS refers to Conflict Tactic Scale  
HITS refers to ‘Hurts, Insults, Threatens, Screams’ scale  
*Responses to exercise question meaningless because of many reverses responses
7.9 Discussion of validation of the CHAT

7.9.1 Summary of main findings of validation

The CHAT is both valid and acceptable for screening for lifestyle and mental disorders in primary care. All items showed good sensitivity, specificity and likelihood ratios when compared with reference standard instruments, except for exercise and eating disorder. The validation of this tool used a pragmatic approach, given that a battery of reference standard tests needed to be administered in a waiting room environment. This meant that brief, but well validated, tools such as the AUDIT, PHQ-9 and HADS were used rather than longer instruments such as a full Composite International Diagnostic Interview which would have been too time-consuming and impractical in this setting.

The low response rates (79.6-79.8%) for the abuse and anger questions may reflect reluctance of respondents to complete the reference standard (CTS-1) for these items. This tool is both very long to be completed in a waiting room setting, and also asks particularly sensitive questions. The other lengthy reference standard was the ACLS for exercise which was completed by only 87.9% of respondents, whereas response rates for the other conditions were 93.7 to 99.8%.

Both the sensitivity and specificity of the single exercise question were extremely low (26% and 40% respectively), with the PPV only 27%, compared with 81% in a previous primary care study which validated it as a screening question for being sedentary. This probably was due the way the question was presented in the CHAT, causing confusion to the respondents. With all the other questions, a ‘yes’ response indicated a possible condition, whereas with the exercise response ‘no’ indicated probable sedentary behaviour. With the exception of the exercise question, ‘no’ responses were down the left-hand column of the tool. This was to aid the clinician by running the eye down the left-hand column to check for absence of conditions needing further enquiry. Examining the reference standard responses of those who ticked ‘no’ to the exercise question, it is apparent that many actually were very physically active, and it seems probable that the format caused them to invert their replies. Because the physical inactivity question is well validated in other studies, we decided to retain it in the CHAT. The design issue has been addressed and to minimise the possibility of confusion, a ‘Yes’ response now means that a person is physically active (not inactive).

The eating disorder prevalence in this study was found to be 14%, which is more than seven times higher than that reported in other studies. We feel the screening question “reference standard” is not precise enough as it was probably identifying participants who had concerns about being overweight and eating patterns rather than a formal eating disorder. A recent validation of the PHQ-ED similarly found a high rate of false positives. As eating disorders are
relatively rare in general practice we planned to remove this question from future screening tools.

7.9.2 Limitations of the validation study
The limitations of this study firstly are that some of the conditions had very small numbers of respondents with the condition. Secondly we used pragmatic reference standard instruments, because administering diagnostic interviews for all conditions would have been excessively time-consuming to conduct in the primary care setting. Some of the reference standards used are diagnostic tools and some are primarily screening instruments that have been validated against a gold standard such as a DSM-IV interview. For example while the South Oaks Gambling Screen (SOGS) might be considered a screening tool, there is no epidemiological 'gold standard' in the area of disordered gambling prevalence\(^{388}\) and the SOGS was used as the reference standard since this is the primary method that has been used to identify problem and pathological gambling since the late 1980s.\(^{389}\)

7.9.3 Strengths of the validation study
A strength of this study is that there was a very low decline rate and a consecutive group of patients. This means our results are probably generalisable to other general practices for consecutive patients. For the high prevalence conditions we found adequate numbers which produced narrow confidence intervals.

A further strength is that all patients completed the reference standards for all the conditions.

7.10 Summary of Chapter 7
The validation study was conducted according to the STARD statement for diagnostic tests\(^{386}\) with 1000 patients completing both the CHAT and the composite reference standard. The CHAT proved to be a valid instrument against the reference standard, with the exception of the questions on disordered eating and the caveat that the exercise question suffered from a form design issue with many of the responses inverted.
CHAPTER 8. RESEARCHING THE HELP QUESTION

8.1 Outline of Chapter 8

This Chapter reports on the effect of the addition of the Help question on the validation of the CHAT and other brief tools. This addresses Aim 5 of the thesis: to assess the effectiveness and validity of the Help question. This question (“Is this something with which you would like help?” with the options of “No”, “Yes but not today”[ie not during this consultation] or “Yes”) was an innovation I developed for the CHAT but can also be used in other contexts. The Help question has been assessed in several different studies as outlined in Figure 8.1.

Figure 8.1 Validation of the Help Question

One of these studies led by Professor Bruce Arroll assessed the validity of the two depression questions and of the anxiety question plus the Help question compared to reference standards and to GP diagnoses. As co-investigator I was involved in the design including developing the study documents, the implementation and co-ordination of the project and contributing to writing the papers.

This resulted in a publication on depression and the Help question, authored by Professor Bruce Arroll, myself, Professor Ngaire Kerse, and Dr Tana Fishman, GP academics at the Department of General Practice & Primary Health Care, University of Auckland. Professor Bruce Arroll conducted the analysis. A second publication addressed anxiety and the Help question. The analysis for this paper was conducted by Ms Sophie Puddifoot (a student at Leeds University, UK) who was lead author of the publication, with co-authors Professor Bruce Arroll, myself, Professor Ngaire Kerse, Dr Tana Fishman and Professor Jane Gunn, University of Melbourne, Victoria, Australia.
The study validating the CHAT outlined in Chapter 6 also validated the Help question, reported in a paper by myself, Professor Bruce Arroll and Dr Nicole Coupe, then Nga Pae o te Maramatanga, Whariki, Massey University, Auckland. This separate analysis demonstrated that the Help question increases specificity without compromising sensitivity, reducing false positives thereby increasing the positive predictive value. It is a second test question only answered if the first is positive. It allows patients with co-morbidities to prioritise issues they wish to address, indicates their readiness to change and promotes self-determination and gives the clinician an indication of which topics to pursue.

8.2 Validity of the two depression questions plus the Help question

8.2.1 Background to validating the two depression questions and Help question

Depression is an important public health problem. Researchers at Harvard University estimate that by 2020 unipolar depression will be second only to ischaemic heart disease as the leading cause of disability-adjusted life years. Depression is very common in general practice with estimates ranging from 5.5% to 65% depending on definition. The suicide rate in depressed people is at least 8 times higher than that of the general population. Most people who die by suicide have a mental disorder, and depression is associated with half of these. On a population basis the most important effect of major depression may be decreased quality of life and productivity rather than suicide. This effect is widespread and has been shown to be comparable to levels associated with major illnesses. Also depressed people frequently present with a variety of physical symptoms and three times the number of somatic symptoms compared to controls in one study leading to excess utilisation of medical services.

Depending on the cut point for defining depression GPs miss anywhere between 50% and 75% of cases. There are many reasons for this. GPs will vary in competencies, skill, communication skill, knowledge base, time and attitudes about their patients, and about symptoms. There are also differences in the type of patients who present to a GP. Often, depressed general practice patients present with somatic symptoms, including gastrointestinal, skeletal muscle, and cardiovascular complaints, rather than describing non-somatic criteria for depression. In addition patient factors such as poor insight into emotional illness add to GP non-detection.

As outlined in Chapter 3, are two sources of information on the value or otherwise of screening for depression in primary care. A UK review by Gilbody et al concluded that screening has little impact on patient outcomes, whereas the US Preventive Services Task Force found a benefit in terms of persisting depression with and without systematic support. They concluded
that screening for depression can improve both detection and outcomes and therefore recommend screening in primary care.

The US Preventive Services Task Force review evaluated 41 screening studies and the two best tools were the screening tool known as the Patient Health Questionnaire (PHQ)\textsuperscript{286} and the Beck Fast Scan for Primary Care (BFSPC).\textsuperscript{398} The PHQ questionnaire consists of nine questions and has been recommended for screening in general practice.\textsuperscript{303,399} The BFSPC consists of seven questions and there is a charge for using each questionnaire. The relative length of these two questionnaires and the cost of the latter make a “no charge” shorter questionnaire an attractive alternative.

A screening tool of two questions (from the original Prime MD)\textsuperscript{21} has been developed in a written form.\textsuperscript{245} These two questions are “During the past month have you often been bothered by feeling down, depressed or hopeless?” and “During the past month have you often been bothered by little interest or pleasure in doing things?” with a sensitivity and specificity of 96% and 57% for depression in patients in whom substance abuse is excluded.\textsuperscript{245} In an Auckland sample when asked verbally the sensitivity was 96% and the specificity was 67%.\textsuperscript{300} After GP interpretation of the two questions the GP diagnosis had a sensitivity of 77% and a specificity of 86% and likelihood ratio positive/negative 5.4/0.27. These are the two questions used for case-finding for depression in the CHAT with the addition of the Help question which asks “Is this something with which you would like help?” with three possible responses: “No”, “Yes but not today” and “Yes”. We refer to this as the two questions with a Help question (TQWHQ). When compared with the Composite International Diagnostic Interview (CIDI) mood module, GPs have a sensitivity of 88% and a specificity of 94% for detecting major depression when using the TQWHQ. The aim of this study aim was to validate the two questions with the Help question against the CIDI.\textsuperscript{301,302,400}

8.2.2 Method for validating the two depression questions and Help question

Nineteen GPs from six practices were approached and agreed to participate in this study. Consecutive patients were approached in the waiting room and asked to participate. After consenting, the patients completed a written document which included the two screening questions with a Help question and the list of psychoactive medications also used in the CHAT validation study (see Appendix 3). The medications included all available antidepressants, anti-anxiety agents, antipsychotic and anticonvulsant medication. The patient then completed the mood module of the CIDI. The research assistant did not look at the responses to the screening questions until the patient had completed the CIDI.

The patient took the written screening questions to the GP for him/her to view. GPs could ask any questions they liked and then completed a form with their opinion on whether or not they
thought the patient was depressed. This form, known as the general practitioner assessment and intervention record (GAIR), which I developed, is reproduced in Appendix D. There was no opportunity for patients to start treatment before completing the gold standard CIDI. The CIDI takes the participants’ answer, arrived at without any interpretation, probe or explanation by the interviewer, as valid data for arriving at diagnoses. The CIDI has been evaluated for test-re-test reliability as well as by comparison with the Schedules for Clinical Assessment in Neuropsychiatry (SCAN). It has also been shown to have excellent test characteristics in primary care.

The sensitivity, specificity and likelihood ratios were calculated according to the calculator on the University of Toronto Website. The study was designed and analysed according to the STARD statement.

Ethical approval was obtained from the Northern Y Regional Ethics Committee, Reference NTY/06/09/080.

8.2.3 Results of validating the two depression questions and Help question

We approached 1094 consecutive patients attending general practice. Overall, 1025 agreed to participate (94% response rate). Figure 8.2 shows the flow of participants in the study.

![Figure 8.2 Study Participants for Two Questions With Help Question (TQWHQ) Study](image-url)
Table 8-1 reports the measures of validity (sensitivity, specificity, likelihood ratios) for the questions answered. It also reports the general practitioner diagnosis after seeing the patients’ written response to the screening and Help questions. The number of false positive responses to true positive responses for the two screening questions alone compared with either screening question plus the Help question was 4.3 (192/45) versus 1.5 (54/37).

### Table 8-1 Sensitivity, Specificity, & Likelihood Ratios of Screening Questions for Depression in Primary care, Help Question, Combination of Screening & Help Questions & GP Diagnosis

<table>
<thead>
<tr>
<th>Variable</th>
<th>% sensitivity (95% CI)</th>
<th>True positive responses*</th>
<th>% specificity (95% CI)</th>
<th>True negative responses†</th>
<th>Positive LR (95% CI)</th>
<th>Negative LR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help question alone</td>
<td>75 (60 to 85)</td>
<td>35</td>
<td>94 (93 to 96)</td>
<td>838</td>
<td>13.0 (9.5 to 17.8)</td>
<td>0.27 (0.17 to 0.44)</td>
</tr>
<tr>
<td>Two screening questions alone</td>
<td>96 (86 to 99)</td>
<td>45</td>
<td>78 (76 to 81)</td>
<td>697</td>
<td>4.4 (3.9 to 5.1)</td>
<td>0.05 (0.01 to 0.21)</td>
</tr>
<tr>
<td>Either screening question plus Help question</td>
<td>96 (86 to 99)</td>
<td>45</td>
<td>89 (87 to 91)</td>
<td>795</td>
<td>9.1 (7.4 to 11.1)</td>
<td>0.05 (0.012 to 0.19)</td>
</tr>
<tr>
<td>GP diagnosis</td>
<td>79 (65 to 88)</td>
<td>37</td>
<td>94 (92 to 95)</td>
<td>835</td>
<td>13 (9.6 to 17.4)</td>
<td>0.23 (0.13 to 0.39)</td>
</tr>
</tbody>
</table>

CI = Confidence interval  
LR = likelihood ratio  
Ideal method for all variables is composite international diagnostic interview (CIDI)  
* Compared with 47 true positive responses in CIDI  
† Compared with 889 true negative responses in CIDI

Table 8-2 reports the likelihood ratios for a positive response to wanting help today, wanting help but not today, and not wanting help, all without the screening questions. When compared with the composite international diagnostic interview, the general practitioners had a sensitivity of 79% and a specificity of 94% for detecting major depression when using the two screening questions with the Help question, giving a positive predictive value of 41% and a negative predictive value of 98.8%.
### Table 8-2 Likelihood Ratio for Answering Help Question with “Yes, Help today,” “Yes, but not today,” and “No help,” without Consideration of Two Screening Questions

<table>
<thead>
<tr>
<th>Answer to Help question</th>
<th>Diagnosis on CIDI</th>
<th>Likelihood ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Help today</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td>Help, but not today</td>
<td>10</td>
<td>24</td>
</tr>
<tr>
<td>No help</td>
<td>12</td>
<td>838</td>
</tr>
</tbody>
</table>

* Diagnosis on reference standard composite international diagnostic interview (CIDI) computer programme

#### 8.2.4 Discussion on validating the two depression questions and Help question

The addition of a Help question to the two screening questions from the Prime-MD questionnaire has a good sensitivity and an excellent specificity for a screening questionnaire for depression. The sensitivity of 79% for the GP diagnosis of depression is an improvement over the 29-35% often reported.\(^3^0\) About five false positive responses for every true positive response have previously been found when the two screening questions are asked verbally.\(^3^0\)

In our present study this ratio changed from 4.3 to 1.5 when patients responded to either screening question plus the Help question. This is much improved and provides a way around the traditional issue of large numbers of false positives in screening studies. Another way of looking at these results is that the likelihood ratio for asking for help today is 17.5, which is high and as such will significantly raise the post-test probabilities above the pre-test value.\(^2^1\)

In our study this means going from a 5.2% pre-test probability of major depression to 48% if patients request help today in response to the Help question. Asking a few more questions would confirm or refute the diagnosis of major depression. This likelihood ratio is better than that associated with the elevation of the ST segment in the diagnosis of myocardial infarction (likelihood ratio 11.20) and D-dimer levels above 1092 ng/ml for diagnosing deep vein thrombosis (3.1) although not as good as venography for diagnosing deep vein thrombosis in patients with symptoms (47.5; see [http://www.cebm.utoronto.ca/](http://www.cebm.utoronto.ca/)). The validity measures of our screening tool for depression are therefore similar to those of physical diagnostic tests.

The strength of this study is that it was carried out in a community setting with GPs and in consecutive patients, excluding patients who were receiving psychotropic drugs. The patients were not attending general practice for any specific predetermined clinical reason. The response rate was high at 94% and it is the first validity assessment of the two questions administered with the Help question. A weakness of our study is that we had no non-screened comparison group – that would require a randomised controlled trial.

For studies of screening for depression in general practice the prevalence is usually reasonably low (5% for major depression in our study). The likelihood ratio for a negative test result does
not therefore need to be low to rule out depression when the test result is negative; in our study a patient with a negative response to the Help question would have a 1% chance of being depressed. Also, the two verbally asked questions had a similar likelihood ratio for a positive result when compared with the 41 screening studies for depression evaluated by the US Preventive Service Task Force. The best screening tool in that review was the Beck Fast Scan for Primary Care (BFSPC), with a positive likelihood ratio of 97 and a negative likelihood ratio of 0.03. Comparable values in our previous study were 4 and 0.17 for the BFSPC and 19.7 and 0.4 for the PHQ. Others have recommended using the PHQ to detect depression in primary care, but our two screening questions are shorter than the questionnaire, have similar likelihood ratios, and enable clinicians to pursue the issue of depression with the Help question.

In our study, only one patient who had major depression did not respond positively to either of the two questions and the Help question. The tool is a very good at ruling out depression if the patient answers no. Patients who responded to the Help question with either help needed today or help needed, but not today had a 48% and 29% chance of having major depression, respectively. A positive response to either screening question plus the Help question signals a 32% chance of having major depression and a negative response signals a 99.7% chance of not having depression. Any of these three options therefore yields a high return. In practice any patient who answers yes to one or both of the screening questions or answers yes to the Help question should be asked three or four more questions about depression, as the screening questions are almost identical to the first two questions of the DSM-IV, revised, for major depression (five symptoms are needed for a diagnosis of major depression).

Our explanation for the improvement in validity with the patient answering either screening question plus the Help question is that it circumvents the many patients who respond to just one of the two screening questions and do not request help. Most of these responses are false positives and the Help question seems to differentiate those with major depression from those without. Patients who respond to both screening questions with or without the Help question are another high risk group, therefore two out of three responses has a high likelihood ratio positive and good validity.

8.3 Validity of the anxiety question plus the Help question

8.3.1 Background to validating the anxiety question and Help question

Anxiety is a common, sometimes severe health problem associated with great costs for individuals and society. In a recent national NZ mental health survey of 13,000 members of the general public, the most common disorder as judged by the 12 month prevalence was anxiety at 14.8% with mood disorders second at 7.9%. Anxiety is particularly prevalent in the general
practice population where estimates of the lifetime prevalence of anxiety disorders are of the order of 25%, with a higher prevalence amongst women.407,408

Anxiety disorders can often be chronic and cause significant morbidity and disability for individuals.409-411 and considered to be precursor for depression. The prevalence of chronic physical conditions such as cardiovascular and respiratory disease has been found to be higher among those who suffer from anxiety.406,412 Psychiatric co-morbidity in anxiety disorders is also extremely frequent and has been reported to be as high as 89% in patients in primary care.408 Commonly anxiety and depression are present together which can increase the severity of disability experienced by patients.407,408,413

Anxiety disorders are also a huge economic burden on society.414 In the US the annual cost of anxiety was estimated to be US $ 63.1 billion in 1998.414 A significant proportion of these costs can be attributed to patients’ high usage of primary care services.415

Despite the high usage of primary care services by people with anxiety disorders, the problem is often not recognised by GPs.413,416 Estimates from one study suggest only 50% of cases of anxiety which present to GPs are diagnosed leading to poorer health outcomes for patients and prolonged duration of anxiety.413 This may be largely explained by the high proportion of patients with anxiety disorders who present with somatic symptoms.417 It may also be partly explained by the current nature of consultations in general practice. As GPs are faced with increasing medico-legal pressures to ensure that serious medical illnesses are not missed during short consultation times, there is little time to explore the possibility of anxiety disorders.

The high prevalence of anxiety in the general practice population makes this an ideal place to identify anxiety. Finding simple and effective ways for GPs to identify anxiety is likely to increase the detection of anxiety disorders, improve health outcomes for patients and reduce the economic burden for society.414

There are several tools currently available for identifying anxiety including the Beck Anxiety Inventory,418 the Penn State Worry Questionnaire,419 the General Health Questionnaire (GHQ),420-422 the HADS,284 GAD-7423,424 and the PRIME-MD.21,22,425-427 All of these tools are self-report instruments and take several minutes to complete. A shortened version of the PRIME-MD, the PHQ, has good specificity and average sensitivity for diagnosing anxiety disorders in primary care (sensitivity 63% and specificity 97%), but it still takes a few minutes to complete.286 This makes the tool potentially unsuitable for consistent use in the general practice population. Currently there is no simple, quick case-finding tool which can be used regularly by GPs to identify cases of anxiety.
We designed two questions to be used to identify cases of anxiety in any adult attending general practice: the first question asks the patient if they have been worrying a lot in the past month and the second offers help to patients. The aim of this study was to determine the suitability of these two questions in case-finding for anxiety in primary care. Case-finding is defined as diagnosing or identifying a condition in patients who consult a GP for a disorder which is different from that trying to be identified.428

8.3.2 Method for validating the anxiety question and Help question

This study was part of the study which also tested the validity of the TQWHQ and the method is described in Section 8.2.2 above. As well as providing demographic information and responding to the TQWHQ, patients were asked “During the past month have you been worrying a lot about everyday problems?” If patients answered yes, they were then asked to complete the Help question (“Is this something with which you would like help?” with three possible answers: “no”, “yes, but not today” or “yes”). The response was considered positive either if the patient requested help today or wanted help but not today.

The patient then completed the HADS, a self-assessment tool used to detect depression and anxiety and indicate the severity of the disorder.371 A score of greater than 11 is considered to indicate significant symptomatology related to a diagnosis of anxiety. A score between 8 and 10 is considered to be a borderline or possible case of anxiety. For this study the HADS was used as a reference standard against which the two questions were validated. While participants also completed the depression module of the CIDI, the anxiety module of the CIDI was not administered as it can be very time consuming and not suitable for a general practice waiting room.401 To ensure blinded completion of the gold standard, the research assistant did not examine the patient’s responses to the screening and Help questions until the patient had completed the HADS.

Patient showed their GP their written responses to the anxiety and Help questions. The GPs were able to ask the patient any questions. They then completed a form (the GAIR, see Appendix D) with their opinion on whether the patient was suffering from an anxiety disorder and whether any intervention was given.

Patients were divided into two groups for analysis: those with a score ≥11 on the HADS, and <11 on the HADS. We calculated the sensitivity, specificity, and likelihood ratios according to the calculator on the University of Toronto (www.cebm.utoronto.ca) website for the case-finding question, Help question and GP diagnosis. The study was designed and analysed according to the STARD statement.429
Ethical approval was obtained from the Northern Y Regional Ethics Committee, Reference NTY/06/09/080.

8.3.3 Results of validating the anxiety question and Help question

We approached 1094 consecutive patients attending general practice. Overall, 1031 agreed to participate (94% response rate). The analysis was performed on 982 patient responses (38 patients were removed because they were on medication and 11 had not completed the HADS). Figure 8.3 outlines participants in this study.

A greater proportion of women than men participated in the study, 710 women (72%) compared to 272 men. The age of patients ranged from 16 years to 93 years. The mean age was 46.5 years.

Using the HADS as a reference standard, 59 patients scored either 11 or more and were therefore considered to be likely suffering from an anxiety disorder. This gives a 6% prevalence of anxiety disorders in this sample. Just under half, 46% (27), had a co-morbidity of depression.
Table 8-3 details the sensitivity, specificity and likelihood ratios (LR) for the worry question, and the GP’s diagnosis. The GP diagnosis had a sensitivity of 58% (95% CI 45% - 69%) and a specificity of 87% (95% CI 85% - 89%) for detecting anxiety (HADS score ≥11). This gives a positive predictive value (PPV) of 22.4% (95% CI 16.5% - 29.6%) and a negative predictive value (NPV) of 97.0% (95% CI 95.6% - 98.0%). The worry question alone has a sensitivity of 76% (95% CI 64% - 85%) and a specificity of 82% (95% CI 79% - 84%), which gives a PPV of 21.2% (95% CI 16.3 - 27.2) and a NPV of 98.2% (95% CI 97.0 - 98.9).
Table 8-3 Sensitivity, Specificity & Likelihood Ratios of Case-finding Question for Anxiety & GP Diagnosis

<table>
<thead>
<tr>
<th>Variable</th>
<th>% sensitivity (95% CI)</th>
<th>% specificity (95% CI)</th>
<th>Positive LR (95% CI)</th>
<th>Negative LR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry question</td>
<td>76</td>
<td>82</td>
<td>4.22</td>
<td>0.29</td>
</tr>
<tr>
<td>alone</td>
<td>(64 – 85)</td>
<td>(79 – 84)</td>
<td>(3.46-5.14)</td>
<td>(0.18-0.46)</td>
</tr>
<tr>
<td>GP diagnosis</td>
<td>58</td>
<td>87</td>
<td>4.52</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>(45 to 69)</td>
<td>(85 to 89)</td>
<td>(3.43-5.95)</td>
<td>(0.36-0.66)</td>
</tr>
</tbody>
</table>

The reference standard is a HADS Score ≥11 on the Anxiety Scale.

Table 8-4 details the likelihood ratios in response to the worry question and Help question. The LR for a positive test increases with a positive response to the Help question. The PPV for those requesting help today was 37.3% (95% CI 25.3% - 51.0%). This is higher than PPV for those requesting help but not today (32.1%, CI:17.9% - 50.7%) and those not requesting any help (12.8%, CI:8.1% - 19.5%).

Table 8-4 Likelihood Ratio for answering the Worry and Help Questions with “Yes, help today,” “Yes, but not today,” “No help” versus HADS as gold standard

<table>
<thead>
<tr>
<th>Answers to worry question and Help question</th>
<th>Diagnosis of anxiety</th>
<th>Likehood ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HADS ≥11</td>
<td>HADS &lt;11</td>
</tr>
<tr>
<td>Yes to worrying a lot during the past month and requested help today</td>
<td>19</td>
<td>32</td>
</tr>
<tr>
<td>Yes to worrying a lot during the past month and requesting help, but not today</td>
<td>9</td>
<td>19</td>
</tr>
<tr>
<td>Yes to worrying a lot during the past month, but not requesting any help</td>
<td>17</td>
<td>116</td>
</tr>
<tr>
<td>No to worrying a lot during the past month</td>
<td>14</td>
<td>756</td>
</tr>
</tbody>
</table>

8.3.4 Discussion on validating the anxiety question and Help question

The prevalence of probable anxiety in this study was 6%. This is slightly lower than some of the figures reported in other studies conducted in primary care. Figures are likely to vary from study to study because of the instruments and definitions used to identify anxiety.

The use of a case-finding question and a Help question in this study increased the positive likelihood ratio, suggesting that these two questions may be valuable in aiding GPs to identify
patients with anxiety disorders. When patients who stated they had been worrying a lot over the past month and requested help today from their GP the LR increased from 2.29 to 9.29. This raises the post-test probability significantly.

Looking at the specificity and sensitivity of the GP diagnosis and the case-finding question alone, it can be seen that asking the worry question on its own has a greater sensitivity than the GP diagnosis (sensitivities 76% versus 58%) and a similar specificity.

Previous studies have examined the validity of other tools used in primary care to detect anxiety disorders. The different tools consistently have greater specificities than sensitivities which is similar to the finding with the case-finding question in this study. The PRIME-MD has been reported to have a sensitivity of 69% and a specificity of 90% for detecting anxiety which is comparable to the PHQ which has a slightly lower sensitivity of 63% and a specificity of 97%. Using these sensitivities and specificities it is possible to calculate the positive likelihood ratios for the screening tools. The PRIME-MD has a Likelihood +ve ratio of 6.9 which is lower than that reported in our study when patients requested help from their general practitioner. The PHQ has a significantly higher Likelihood +ve ratio of 21. Despite the higher LR, the PHQ is a screening tool which does not lend itself to frequent use in the primary care setting. It is a four page questionnaire completed by the patient before consultation.

Strengths of this study are that it was conducted in a primary care setting, consecutive patients were approached and patients on psychotropic medication were excluded. The response rate was extremely high at 94%. Weaknesses are that a non-screened comparison group was not included, the GPs were not randomly selected (GPs could only participate if they had the necessary space for the research assistant to conduct the research) and the HADS, a screening tool, was used as a reference standard. The decision to use the HADS over other reference standards was that it can be easily and effectively administered in a general practice clinic, it has been used extensively across a wide variety of medical settings and has been consistently reported to have good sensitivity and specificity in general practice (sensitivity 67% and specificity 83%-93%).

It is important that if this case-finding tool is employed that GPs act on the outcome appropriately and provide suitable interventions for patients. It is also important that GPs and nurses are aware of the limitations of the tool and the high false positive rates. The harms from false positives may outweigh the benefits of finding true cases. A randomised controlled trial of these two questions versus usual care is warranted.
8.4 Validity of the CHAT plus the Help question

8.4.1 Background to validating the CHAT and Help question

There is progressive trend for primary health care to be a continuing health care process, improving community health through preventive services, disease prevention, screening and generalist first-level interventions. However many at-risk behaviours and mental health issues remain unidentified in routine practice with an estimated 30% of those needing treatment receiving it.

Validation of the tool was conducted with 1000 consecutive primary care patients completing both the CHAT and a composite gold standard. The aim of this subsequent analysis is to assess the additional value of the Help question for each of the individual items.

8.4.2 Method for validating the CHAT and Help question

The design and methods of this study are described in Chapter 7 which assessed the validity of the base questions.

1000 consecutive adult patients were recruited from waiting room situations to complete both the CHAT and the composite gold standard. However only 755 of the CHAT forms also included the HELP question. This analysis was conducted on all cases where participants had completed both the base questions of the CHAT plus the Help question, as well as the gold standard.

The sensitivity and specificity of the CHAT questions with and without the addition of the Help question have been calculated for items relating to tobacco use, alcohol and other drug misuse, problem gambling, depression, anxiety and stress, abuse and anger problems. The questions relating to eating disorders are not included because these have been shown to be invalid. Likewise the question relating to inactivity has been omitted from this analysis because the initial format of the question in the validation study was reversed (a ‘yes’ response meant that the person was physically active) which was confusing and led to inverted responses in some cases. The current version of the CHAT has addressed this issue (see Appendix E).

Data were entered into an ACCESS database. Sensitivities, specificities, likelihood ratios and predictive values were calculated using the Centre for Evidence-based Medicine stats calculator (http://www.cebm.utoronto.ca/practise/ca/statscal/).
8.4.3 Results of validating the CHAT and Help question

The case prevalence detected by the reference standards ranged from 0.3% to being a victim of verbal abuse or for having difficulty controlling one’s physical anger to 11.3% for problematic drinking (Table 8-5).

Sensitivity ranged from 80 to 98% for the higher prevalence conditions (depression, nicotine dependency, anxiety, problematic drinking). In low prevalence conditions such as problematic gambling and drug use, abuse and difficulty controlling anger, sensitivities are lower and confidence intervals have a much higher range.

**Table 8-5 Case Prevalence of CHAT Domains according to the Reference Standards**

<table>
<thead>
<tr>
<th>Case prevalence: % reference standard positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine dependency</td>
</tr>
<tr>
<td>Problematic drinking</td>
</tr>
<tr>
<td>Problematic drug use</td>
</tr>
<tr>
<td>Problematic gambling</td>
</tr>
<tr>
<td>Major depression</td>
</tr>
<tr>
<td>Anxiety</td>
</tr>
<tr>
<td>Being verbally abused</td>
</tr>
<tr>
<td>Being physically abused</td>
</tr>
<tr>
<td>Being verbally angry</td>
</tr>
<tr>
<td>Being physically angry</td>
</tr>
</tbody>
</table>

Table 8-6 demonstrates that for each condition the specificity increases with the addition of the Help question.
### Table 8-6 CHAT Sensitivity and Specificity With and Without the Help Question vs Reference Standard

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sensitivity %</th>
<th>Specificity % (95% CI)</th>
<th>Specificity % (95% CI)</th>
<th>Specificity % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine dependency*</td>
<td>88 (77-95)</td>
<td>91 (89-93)</td>
<td>99 (98-99)</td>
<td></td>
</tr>
<tr>
<td>Problematic drinking†</td>
<td>80 (70-87)</td>
<td>85 (82-87)</td>
<td>99 (99-100)</td>
<td></td>
</tr>
<tr>
<td>Problematic drug use‡</td>
<td>64 (39-84)</td>
<td>98 (97-99)</td>
<td>99 (99-100)</td>
<td></td>
</tr>
<tr>
<td>Problematic gambling§</td>
<td>80 (38-99)</td>
<td>98 (97-99)</td>
<td>99 (99-100)</td>
<td></td>
</tr>
<tr>
<td>Major depression‖</td>
<td>98 (86-100)</td>
<td>73 (70-76)</td>
<td>98 (97-99)</td>
<td></td>
</tr>
<tr>
<td>Anxiety**</td>
<td>85 (75-92)</td>
<td>77 (73-80)</td>
<td>99 (98-100)</td>
<td></td>
</tr>
<tr>
<td>Being verbally abused††</td>
<td>57 (33-79)</td>
<td>97 (96-98)</td>
<td>99 (98-100)</td>
<td></td>
</tr>
<tr>
<td>Being physically abused‡‡</td>
<td>80 (38-99)</td>
<td>94 (92-95)</td>
<td>99 (98-100)</td>
<td></td>
</tr>
<tr>
<td>Being verbally angry††</td>
<td>77 (50-92)</td>
<td>92 (89-94)</td>
<td>99 (98-100)</td>
<td></td>
</tr>
<tr>
<td>Being physically angry‡‡</td>
<td>50 (15-85)</td>
<td>91 (88-93)</td>
<td>99 (98-100)</td>
<td></td>
</tr>
</tbody>
</table>

Help question scored positive if patients indicate that they would like help either today or later

* Heavy Smoking Index (HSI) >2
† Alcohol Use Disorders Identification Test (AUDIT) > 7
‡ Drug Abuse screening Test (DAST) >5
§ South Oaks Gambling Screen (SOGS) ≥4
‖ Patient Health Questionnaire Depression Scale (PHQ-9) ≥15
** Hospital Anxiety and Depression Scale (HADS) >10 A
†† Conflict Tactic Scale (CTS-1) Verbal aggression scale ≥15
‡‡ Conflict Tactic Scale (CTS-1) Physical aggression scale ≥24

Table 8-7 presents the LR of the reference standard being positive when people indicate whether they want help (today, later, not requesting help; or requesting help either today or later) for the higher prevalence conditions of nicotine dependency, problematic drinking, major depression and anxiety. When LRs of being a positive case if the Help question is answered in the positive are calculated, it can be seen that wanting help today indicates a very high likelihood of the person being positive for that particular condition. Positive LRs for all four conditions show a consistent progression downwards from wanting help today to wanting help at a later date. When wanting help either today or later is combined, the LRs range between 9.4 and 11.8.
### Table 8.7 Effect of Help Question on Likelihood Ratio of being a Positive Case for Nicotine dependence, Problematic Drinking, Major Depression or Anxiety

<table>
<thead>
<tr>
<th></th>
<th>Nicotine dependency Positive LR</th>
<th>Problematic drinking Positive LR</th>
<th>Major depression Positive LR</th>
<th>Anxiety Positive LR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help today</td>
<td>11.5 (3.6-36.4)</td>
<td>70.2 (3.8-1292.6)</td>
<td>21.6 (10.4-45.0)</td>
<td>18.2 (8.0-41.0)</td>
</tr>
<tr>
<td>Help but not today</td>
<td>10.4 (6.0-17.4)</td>
<td>6.6 (2.0-21.0)</td>
<td>5.2 (2.3-11.7)</td>
<td>5.8 (3.0-11.4)</td>
</tr>
<tr>
<td>Not requesting help</td>
<td>0.6 (0.5-0.7)</td>
<td>0.9 (0.8-1.0)</td>
<td>0.5 (0.3-0.7)</td>
<td>0.6 (0.5-0.8)</td>
</tr>
<tr>
<td>Help requested</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(either today or later)</td>
<td>10.6 (6.7-16.8)</td>
<td>11.8 (4.3-32.4)</td>
<td>10.3 (6.6-15.9)</td>
<td>9.4 (5.9-14.9)</td>
</tr>
</tbody>
</table>

#### 8.4.4 Discussion on validating the CHAT and Help question

The findings indicate that the Help question serves as a ‘second-step’ for case-finding, and increases the specificity of the test without compromising the sensitivity. It deals with the top line of the two by two table therefore it only deals with positive results. This serves to reduce the false positives – people scoring positive to a CHAT question and indicating that they would like help with this are more likely to actually have the condition being assessed. The results also demonstrate a progressive increase in LR from wanting help some time in the future to wanting help today and this raises the post-test probability.

Asking patients whether an issue is something with which they would like help assists primary health practitioners in detecting those who are likely to respond to treatment. It allows patients who may have co-morbidities (for example, problem gambling, drinking and depression) to prioritise the issue they wish to address. This has the added benefit of not overloading the clinician with multiple problems to deal with in one consultation. Similarly the option of wanting help at a later date enables scheduling of a specific appointment. Patients’ indication that they want help is likely to be associated with their readiness to change. Patients who score positive but who do not want help can still be offered a brief intervention. For example, nicotine dependent smokers who say no to help (wish to continue smoking) can be told that if and when they do decide that they would like to address their smoking, there is help that can be made available.

This study was limited by the fact that some of the conditions are low prevalence hence numbers are low and confidence intervals wide. Furthermore pragmatic reference standard instruments were used because conducting diagnostic interviews for all conditions would have been excessively time-consuming in the primary care setting and beyond the study resources.
However there was a consistent finding that use of the Help question improves specificity while maintaining sensitivity, and that the likelihood ratios of having a condition increase when patients indicate they would like help and more so when they identify that they would like help today. Because patients complete the CHAT before their consultation, the Help question enables them to indicate whether or not it has brought up any issues which they wish to address in today’s consultation. This means that it is unlikely to inhibit or hinder a patient discussing their own agenda rather than their doctor’s prevention agenda.

Because it is quick to use and well-accepted, the CHAT can be used for follow-up after intervention for identified problems. Our next research step in the development of this tool is to conduct a randomised trial to test against clinical outcomes. This will establish whether systematic use of the CHAT in the primary care setting leads to better health outcomes for patients.

The CHAT can be used to identify at-risk people within a community to provide education, primary prevention and early intervention to improve health. It is a simple, efficient validated tool well-suited to the resource and time-strapped primary care environment, allowing rapid assessment by primary care providers of important mental and social needs of their patients. The Help question increases specificity without compromising sensitivity and reduces the numbers of false positives thereby increasing the positive predictive value of the test. It also identifies issues about which patients have concerns and their readiness to change. It is essentially a second test that is accessed when there is a positive response. It allows them to prioritise their problems and reduces the burden on the GP at the initial consultation.

8.5 Summary of Chapter 8

The Help question is a specific innovation of the CHAT. In this chapter I have presented three studies which have all demonstrated that addition of the Help question improves the specificity of tests: ultra-brief tools for depression and anxiety as well as the domains covered in the CHAT. Along with leading to a higher likelihood ratio of these tests, the Help question is a patient-centred approach, allowing patients to identify whether they want help immediately or at a later date. If they have several issues it enables them to prioritise the areas where they would first like to make change.
CHAPTER 9. FURTHER DEVELOPMENTS OF THE CHAT AND THE eCHAT

9.1 Outline of Chapter 9

While the version of the CHAT presented in Appendix A includes questions assessing for eating disorders, these proved to be imprecise and probably identified concerns about eating patterns and being over-weight rather than formal eating disorders and have been removed from the current CHAT. The tool now has been evaluated and validated, but work on the CHAT is ongoing. It is being adopted for use in a variety of primary care and community settings in where strong argument can be made for case-finding for unhealthy behaviours and negative mood states with subsequent intervention.

Figure 9.1 Outline of Chapter 9 - Further Development of the CHAT

A feasibility study was conducted to convert the paper-based tool to an electronic version, known as the eCHAT. Once the eCHAT results are available to the GP in the Practice Management System (PMS), a diverse range of clinical decision supports and resources can be integrated for each of the eCHAT domains. These can include generic interventions and links to local agencies and services.
A number of both research and implementation initiatives of the eCHAT in both NZ and overseas are now in various stages of development.

In this chapter I outline some of the initiatives that have used the eCHAT, detail the feasibility study of the eCHAT including possible decision supports that might be implemented, and describe the new directions that eCHAT may be heading (see Figure 9.1).

9.2 Utilisation of the CHAT

The CHAT has been utilised in a variety of clinical and community settings both in NZ and internationally.

9.2.1 Use of the CHAT and / or the Help question in practice

9.2.1.1 Use of the CHAT in the Primary Options Lifestyle Programme of a Primary Mental Health Initiative

Dr Jill Calveley initiated the Primary Options Lifestyle Programme in 2007 in her role as the Clinical Director of Harbour Health PHO. She had made significant contributions in numerous parts of the health sector as a rural GP, within primary and secondary care organisations, the Accident Compensation Corporation and NGOs. As well as general practice, Dr Calveley had qualifications in epidemiology, public health and philosophy and was able to engage with the health sector from a wide range of perspectives. She passionately believed that the sole purpose of the health service is to improve the health of people and brought her compassion and her critical appraisal skills to all her many roles. She died tragically and unexpectedly on 30 December 2008 and her paper on this initiative, summarised below, was published posthumously.433

The CHAT is the entry criterion into the Primary Options Lifestyle Programme of a Primary Mental Health joint initiative by the Harbour and Health West Primary Health Organisations (PHOs) which provides a funded GP consultation, free or subsidised help from selection of intervention programmes and a free follow-up GP consultation.433 This programme was initiated to enable people with mild to moderate mental health and lifestyle problems to be reliably identified and then to have access to appropriate services as soon as possible. Two key principles were that a sense of engagement in a programme434 and that telephone prompting435 increases patients’ likelihood that they will attend.

The initiative uses a patient-centred pathway - the patient identifies a problem and participates in the selection of interventions appropriate to its treatment, with prompt access to available resources. The evaluation focused on the utility of the model in primary care as to whether it is
practicable, fits in with general practice workflow, meets patient requirements for choice and timeframes and is a viable model for people providing the interventions to whom patients are referred.

Adult patients (school leavers and older) were asked by their GPs to complete a CHAT. Patient selection was at the discretion of the GP who discussed the completed CHAT with the patient. Those patients requiring or already receiving secondary care level mental health interventions were not eligible. Patients who answered yes to the Help question were asked whether they would like to make a 30 minute appointment to see the GP to discuss intervention options for the mental health/lifestyle problem revealed by the CHAT assessment. GPs were assisted in this by a comprehensive complied resource manual. They could either refer internally or externally and the intervention lasted up to three months. A programme coordinator based at Harbour Health PHO provided information and support to patients, GPs, practices and service providers; facilitated patient access to services, and followed up patients who did not attend these services. The overall pathway is summarised in Figure 9.2.

**Figure 9.2 Pathway for Primary Lifestyle Options Programme**

The in-house option was up to four 15 minute free consultations with the GP (in addition to the first 30 minute and 15 minute follow-up consults) for problem-solving or behavioural change
management. Approximately 150 different providers were available for external referral, including individual, group, community and support services specifically for Maori, Pacific Island, and Asian patients and their details were provided in the resource manual (examples in Table 9-1).

**Table 9-1 External treatment provider examples for Primary Lifestyle Options**

<table>
<thead>
<tr>
<th>Examples of external treatment options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
</tr>
<tr>
<td>Smokefree Harbour Health; Quitline; Asian Smokefree</td>
</tr>
<tr>
<td>Alcohol / Illicit drugs</td>
</tr>
<tr>
<td>Community Alcohol and Drugs, Alcoholics Anonymous, Alcohol and Drug Helpline</td>
</tr>
<tr>
<td>Gambling</td>
</tr>
<tr>
<td>Community Alcohol and Drugs, Alcoholics Anonymous, Alcohol and Drug Helpline</td>
</tr>
<tr>
<td>Depression / Anxiety</td>
</tr>
<tr>
<td>Individual sessions with psychologist / psychotherapist / counsellor</td>
</tr>
<tr>
<td>Essential Men Weekend Course; Youthlink Family Programme; Life Line; Youth Line; Phobic Trust; many other Family and Community Service organisations</td>
</tr>
<tr>
<td>Violence, Abuse, Anger</td>
</tr>
<tr>
<td>Individual sessions with psychologist / psychotherapist / counsellor</td>
</tr>
<tr>
<td>Victim Support; Man Alive; North Harbour Living Without Violence; North Shore Women's Centre</td>
</tr>
<tr>
<td>Exercise</td>
</tr>
<tr>
<td>Green Prescription Waitakere or North Shore, 10 weeks local Gym.</td>
</tr>
</tbody>
</table>

All services were free for patients. The pilot, a joint initiative between Harbour Health and HealthWEST PHOs, was funded by the Waitemata DHB and was approved by their Ethics Committee.

The pilot involved 69 GPs who enrolled between one and 35 patients each. Between October 2007 and June 2008 a total of 456 patients were referred for one of the interventions. See Table 9-2 for their demographic details. When the report was compiled in November 2008:

- 357 (78%) had been referred to external providers.
- 99 (22%) had been referred internally to GP or practice nurse - 20 of these were for smoking cessation and eight for Green Prescription / exercise counselling.
- 91 (20%) had completed their full course of interventions and their ‘exit consult’ with their GP.
- Approximately 40 had not had their final ‘exit’ consult with their GP despite completing their interventions.
- 60 (13%) patients had not attended any intervention session.
Table 9-2 Demographics of Patients Enrolled in the Primary Lifestyle Options Programme

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>292</td>
<td>64</td>
</tr>
<tr>
<td>Male</td>
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<td>36</td>
</tr>
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<td>Pacific</td>
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<td>1</td>
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<tr>
<td>Other</td>
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<td>8</td>
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<tr>
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<td>65-74</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>75-84</td>
<td>11</td>
<td>2</td>
</tr>
</tbody>
</table>

People requested help for all problem areas on CHAT (see Figure 9.3). The commonest amongst the 839 listed reasons for referral were depression (37%) and anxiety (26%) with 67% having depression and 57% having anxiety for at least one of their referral reasons. Over half (57%) had two or more reasons for referral with the commonest coexisting condition being anxiety-depression (35%).

![Figure 9.3](image-url)  
*Figure 9.3 Numbers of People Requesting Help for each CHAT Domain in Primary Lifestyles Options Programme*
Feedback was obtained from 52 patients via a confidential written questionnaire. Most patients rated the CHAT as being ‘helpful or very helpful’ (Figure 9.4).

![Figure 9.4 Patient Rating of CHAT in the Primary Lifestyles Options Programme](image)

Thirty seven of the 69 GPs who enrolled their patients in the programme gave feedback via a confidential on-line questionnaire.

- 90% felt that the steps in the programme were clearly described.
- 81% felt they were easy to implement.
- 76% felt that the programme’s Resource Manual was ‘useful’ or ‘very useful’ and a further 21% indicated that ‘some parts were useful’.
- 71% introduced the CHAT form to their patients during the course of a consult; the remainder indicated that their practice nurse introduced it to some of the patients. Practice receptionists were not involved.
- 70% (of the foregoing 71%) gave the CHAT to those patients they thought would benefit, ie. opportunistically. However, a further 22% selected patients specifically and invited their participation. No GP gave the form to every waiting patient.
- 57% felt that the initial 30-minute consult was ‘easily’ long enough, and a further 41% felt that it was ‘just' long enough.
- 80% felt that the referral process to outside providers ‘went smoothly’.
- 36% felt that the final 15-minute follow-up consult was ‘plenty' and 55% felt it was ‘just’ long enough.
- Most felt that the role of the programme coordinator was helpful, with 39% regarding this as ‘essential’.
- 94% of GPs felt that this programme enabled their patients to access appropriate interventions, and 85% felt that this was within suitable timeframes.
- 95% indicated that they would continue their involvement with this programme, and 74% would increase their involvement if funding permitted.
A number of GPs requested an electronic version of the CHAT.

Feedback via a confidential on-line questionnaire from 44 of the 49 external providers who had patients referred to them through the programme indicated that all referrals made by GPs were appropriate to the particular service they provided, and most felt that the referring information was always (34%) or mostly (58%) adequate. Overall, 84% of providers felt that the programme was ‘useful’ or ‘very useful’ as a model of care.

This pilot programme focused on feasibility of the model. Firstly, it utilised the CHAT; secondly, it gave the GP 30 minutes of dedicated time to discuss this and work with the patient to decide on treatment options; thirdly, a coordinator facilitated the patient’s entrée to a wide choice of treatment providers external to their GP, and was available to deal with any follow-up issues with the provider and fourthly, the pathway was able to be ‘wrapped up’ by the patient seeing their GP for a dedicated follow-up consult to review progress. The whole process was funded, enabling people who otherwise could not access this treatment to do so, at an earlier stage in their mental health/lifestyle problem than would otherwise be possible under existing referral pathways.

9.2.1.2 Use of the CHAT in other Primary Care and Community Settings

The CHAT is being used in a wide variety of other primary health care and community settings. These include:

- Use in a Waikato PHO project which seeks to help people who have been on the sickness or invalid benefit to move to greater work readiness. The CHAT is used with clients in their initial interview.

- Used to develop policy in assisting clients in South Auckland by the NZ Ministry of Social Development in a Work and Income setting.

- Use for lifestyle evaluation by the MOH Auahi Kore Marae project (an innovative approach to encouraging 16 maraes to become smoke-free) in the Hawke’s Bay has been evaluated by the Faculty of Health and Sport Science, Eastern Institute of Technology (funded by the Hawkes Bay District Health Board) because it is both brief and appropriate for Māori.

- Addition of the Help question is recommended as an indicator for case-finding for depression in the UK primary care Quality and Outcomes Framework (QOF). 436

- Provided as a resource in the Australian Government’s Department of Health and Ageing Risk Factor Resource Kit for a resource guide for lifestyle prescriptions in South Australian general practices. 437

- Used in the development of HealthCheckPlus, an internet-based health resource designed to facilitate real-time health screening in Canada. 438 This programme was developed by Dr
Darcy Santor, Senior Research Scientist at the Provincial Centre of Excellence for Child and Youth Mental Health and the University of Ottawa, Canada.

- Some NZ practices have used the paper-based CHAT with all new patients, and asked adult patients to complete it if it is over two years since their last visit.

### 9.2.2 Use of the CHAT and / or the Help question in research

The CHAT is being used in a number of research settings:

- To identify young Samoans (high school and general practice samples) with concerns relating to depression, anxiety, abuse or anger for an explanatory qualitative study involving semi-structured individual interviews.\(^{439}\)

- To determine lifestyle problems and mood factors among Indian sub-continent immigrant youth living in Auckland.\(^{440}\)

- The diagnostic accuracy of the TQWHQ has been assessed in a government funded primary care clinic in Malaysia.\(^{441}\) The participants included 146 consecutive female patients receiving no psychotropic drugs and who were Malay speakers. The main outcome measures were sensitivity, specificity, and likelihood ratios of the two screening questions, the Help question, combination of the screening and Help questions. The TQWHQ showed a sensitivity and specificity of 98% (95% confidence interval 87% to 99.8%) and 70% (61% to 78%), respectively. The likelihood ratio for a positive test was 3.3 (2.5 to 4.4) and the likelihood ratio for a negative test was 0.02 (0.00 to 0.35). The positive predictive value was 48%, while the negative predictive value was 99.8%. Overall, 45% (65 / 146) of the patients screened positive for depression. The TQWHQ detected most cases of depression among women patients in this study. The post-test probabilities suggest one false positive for every true positive, while a negative result may be a good indicator of no need for further evaluation for depression. Based on these findings, screening for depression with the TQWHQ can be strongly recommended for practice in government primary care clinics in Malaysia.

- The CHAT is being used by Dr Dan Vinson, Department of Family and Community Medicine, University of Missouri-Columbia in research addressing the integration of alcohol screening in family medicine in Missouri, USA.\(^{442}\)

### 9.2.3 Use of the CHAT in depression guidelines

The CHAT is included as a recommended screening/case-finding tool in the NZ evidence-based best practice guideline on the identification of common mental disorders and management of depression in primary care.\(^{443}\) In 2009 the Ministry of Health funded the Best Practice Advocacy
Centre (BPAC) to make the CHAT, along with several other tools, freely available on GPs’ practice management systems (PMS) nationwide.

However the version of the CHAT made available to GPs through the PMS is as a pdf form which takes a number of ‘clicks’ to access. Because it cannot be entered electronically nor be self-administered by the patient, this format does not facilitate practices to easily use the CHAT either before or during consultations.

9.3 Feasibility study of the eCHAT

We recently have conducted a study to test whether it is feasible, acceptable and practicable to adapt the paper-based CHAT into an electronic format to enable primary care patients to complete it in the waiting room, and make this information, including scored diagnoses where relevant, available to GPs during the consultation via their PMS (the last aim of this thesis). The electronic form of the CHAT is known as the eCHAT. My collaborators in this study were Professor Jim Warren, Chief Scientist for the National Institute for Health Innovation (NIHI) and Professor Bruce Arroll, Department of General Practice & Primary Health Care, University of Auckland. Others who have assisted in this project include Dr Chris Paton, Research Fellow, NIHI, Ms Debra Warren, NIHI, Tusitha Mabotuwana, NIHI, Ms Denise Miller, nurse and research assistant, Clinical Trials, and Dr David Newcombe, psychologist in Community and Social Health, University of Auckland. This study has been published presented at a conference444 and published in a peer-reviewed journal445 with Professor Jim Warren as lead author.

9.3.1 Background to the feasibility study of the eCHAT

The CHAT is ideally self-administered, either in the waiting room or even prior to arriving at the practice, for example at home through a patient portal. Almost 100% of GPs now use electronic records, predominantly via the PMS. A paper-based CHAT prevents integration into the PMS unless the data are transcribed. For GPs to use the tool effectively it needs to be administered and accessed electronically, with results integrated with the PMS software so that the GP can view, discuss and potentially follow-up eCHAT findings during the consultation. A further benefit of PMS integration is the potential to track the scores acquired in the eCHAT to monitor individual patient progress or to provide measures for following overall practice caseload characteristics and performance.
One of the options for patient waiting room self-administration include utilisation of a large touchscreen display along the lines of the central interactive component of an automated banking machine or an airport self-check-in kiosk. Smaller devices ranging from 3G phones to tablet PCs are promising in terms of potential usability, although there are concerns that such portable devices would be exposed to damage or theft in a relatively unsupervised waiting room environment. A solution to this is the recent development of portable tablet PC stands such as the simple tablet kiosk produced by iPadEnclosures illustrated to the right:

![Simple Tablet Kiosk](www.ipadenclosures.com/ipad_kiosk_enclosure/ipad_kiosk_stands/simple_ipad_stand)

Touchscreen systems have been found acceptable in health care settings. A Patient Assessment System (PAS) with a touchscreen user interface for patients producing a one-page summary for the physician was used by two outpatient mental health clinics by patients with severe mental illness while awaiting their scheduled appointments. This PAS reviewed patients’ depression/functioning, interpersonal problems, psychosis, substance abuse, self-harm, medication compliance and side effects. It was considered enjoyable and easy to learn and use by patients. A touchscreen-based assessment of pain, fatigue and global health using visual scales was found to be as valid as paper forms in a rheumatology clinic setting. A touchscreen PHQ-9 for cancer patients in a waiting room was shown to have good construct validity and high feasibility (with 96% of patients who attempted the PHQ-9 completing it) and took an average of two minutes per patient to complete.

### 9.3.2 Aims and objectives of feasibility study of the eCHAT

The aims of this study were to convert the CHAT into an electronic format integrated into the PMS, to field test its continued validity and usability within general practice and to conduct a feasibility study to inform a randomised controlled trial (RCT) of the effectiveness of systematically using the eCHAT on patient outcomes.

The specific objectives of the project were:

- To integrate the CHAT into an electronic format, incorporating seamless transition to appropriate scored diagnostic tests when patients respond positively to sentinel questions.
- To achieve a degree of integration between the eCHAT and the PMS including priming with the identities of patients in the waiting room, CHAT results made available in the PMS in a format viewable by the GP and with computed diagnostic scores where applicable.
- To enable CHAT results to be stored in the PMS as analysable data (for example, smoking status or computed PHQ-9 depression score) with allowance for repeated measures.
- To conduct a feasibility pilot study on the use of the eCHAT system within general practice to assess the mechanics and acceptability of the proposed RCT.
9.3.3 Methodology of the feasibility study of the eCHAT

This project required the development of a number of different components to be evaluated and implemented. Firstly we needed to develop the content of the eCHAT, selecting and incorporating the additional scored tests and defining the gate-keeping questions (see Section 9.3.4) and determining which questions are unconditional and which only follow in the context of specific prior responses.

Secondly we needed to design the patient interface which was field tested to ensure acceptability and ease of use by adult patients including the elderly (see Section 9.3.5).

Thirdly we needed to design the GP interface (see Section 9.3.6). The results of the eCHAT need to be available in the PMS software to enable the GP interact with the patient regarding their eCHAT responses during the consultation, record interventions and potentially arrange follow-up. NZ is recognised as in the top tier of nations with respect to information technology (IT) use in general practice. To extend the NZ general practice PMS capability, we wanted the results of the eCHAT to be highly integrated with the PMS. Rather than only printing a summary page, we wanted the results also to be available on the PMS as data:

1. A summary report available for the GP including the scores and interpretation of any additional tools completed during eCHAT completion
2. The GP needed to be able to complete an eCHAT with a patient if the latter was called through before completing it in the waiting room, or if they chose to do so opportunistically during the consultation, hence we needed the patient eCHAT interface available for the GP to review responses in detail, initiate eCHAT with patients and complete an unfinished eCHAT with the patient.
3. Responses integrated with compatible data elements in the PMS data repository such as in the Classification, Screening or Measurement fields (for example to allow scores to be charted over time or aggregated across the practice).

Lastly direct IT integration was needed between the patient touchscreen and the GP PMS computer interface through the local practice IT network by either by cable or wireless (see Section 9.3.7). We needed this to be field-tested by GPs for usability.

The feasibility study received approval from the Auckland Regional Ethics Committee (Reference No: NTX/09/04/034).

9.3.4 Development of the eCHAT content

The eCHAT is designed to enhance the paper-based CHAT using the opportunities inherent in online delivery. Moving from paper to online offers the opportunity to build in a tree-like structure
whereby the eCHAT is able to either move rapidly to another issue if the initial questioning has negative responses, or to extend questioning, including using scored tests, where responses are positive. This context-sensitive questioning is usually referred to as branching, where questions are either unconditional (a question follows irrespective of selected answer) or conditional (a question is skipped when a previous answer(s) meet specific criteria, in the case of the CHAT usually a negative response) and the answer is conditional (answer-specific where a question follows a specific answer).  

If a patient answers No to an initial question (for example, about smoking), there is no need for the Help question to be triggered and the eCHAT can move to the next item (eg drinking alcohol). If they answer yes, context-sensitive conditional questioning allows for the eCHAT to move seamlessly on to more in depth tools which can give a diagnostic score available to the GP during the subsequent consultation. Positive responses for smoking, alcohol and other drug use lead directly to the WHO Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), for depression into the PHQ-9 and for anxiety into the Gad-7. In the cases where there are these added “second-tier” diagnostic tools the addition of the Help question is no longer needed to assist with specificity. However we retained it because of its patient-centred attributes and it allows the practitioner to know the patient’s perspective on whether they wish to address a particular problem. While some of the CHAT items (substance abuse, depression and anxiety) further tools are indicated, others are better dealt with during conversation regarding the indicated issue (problem gambling, abuse, anger control and physical inactivity) with subsequent management as indicated. There is the ability to add further second-tier tools in the future.

Because a negative response to the gate-keeping question(s) also skips the question on whether the patient would like help with that issue, many patients will be presented relatively few of the questions in the eCHAT repertoire. This shortens the duration of the test and hence improves acceptability.

9.3.4.1 eCHAT and using tobacco

Since the CHAT was developed, an international group of substance abuse researchers working for the WHO have developed the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) to detect and manage substance use and related problems in primary care settings. The ASSIST has been validated against a number of reference standards including the Revised Fagerström Tolerance Questionnaire (for smoking), the AUDIT (for alcohol) and the DAST (for other drugs) which were used in the CHAT validation. The ASSIST initially asks about lifetime use of substances followed by use in the last three months. For the purpose of case-finding of current problems, we elected not to question about lifetime use. The ASSIST is designed to skip questions if people respond negatively to specific substance use, hence it is very suitable for adaption to an electronic format. We separated the
ASSIST v3 questions into those relating to tobacco use, alcohol use and non-prescription or recreational drug use.

There are five ASSIST questions on tobacco use, with the options for reply “Never”, “Once or twice”, “Monthly”, “Weekly” or “Daily or almost daily” for the first three questions and “No, never”, “Yes, in the past 3 months” or “Yes, but not in the past 3 months” for the last two. If there is a “Never” response to the first question ("In the past three months, how often have you used tobacco products (cigarettes, chewing tobacco, cigars, etc.)?") the eCHAT skips to the first question about drinking.

Completing the ASSIST tobacco questions produces a Tobacco use score (sum of scores Assist Tobacco 1 to Assist Tobacco 5) Range 0 to 31:
- 0-3 Low risk of health and other problems from current pattern of use.
- 4-26 At risk of health and other problems from current pattern of tobacco use.
- >26 At high risk of experiencing severe problems (health, social, financial, legal, relationship) as a result of current pattern of use and are likely to be dependent

Positive responses to the tobacco questions trigger the Help question.

9.3.4.2 eCHAT and drinking alcohol
There are six ASSIST questions on alcohol use, with the options for reply “Never”, “Once or twice”, “Monthly”, “Weekly” or “Daily or almost daily” for the first four questions and “No, never”, “Yes, in the past 3 months” or “Yes, but not in the past 3 months” for the last two. If there is a “Never” response to the first question ("Do you drink alcohol?") the eCHAT skips to the first question about other drugs.

Completing the ASSIST alcohol questions produces an Alcohol use score (sum of scores Assist alcohol 1 to Assist alcohol 6) Range 0 to 39:
- 0-10 Low risk of health and other problems from current pattern of use.
- 11-26 At risk of health and other problems from current pattern of alcohol use.
- 27-39 At high risk of experiencing severe problems (health, social, financial, legal, relationship) as a result of current pattern of use and are likely to be dependent

Positive responses to the alcohol questions trigger the Help question.

9.3.4.3 eCHAT and non-prescription or recreational drug use
If the respondent answers no to the eCHAT question “Do you use non-prescription or recreational drugs?” or the other two CHAT questions on non-prescription or recreational drug use, the system skips to the first gambling question. The ASSIST\textsuperscript{267} covers seven drug types:
1. Cannabis (marijuana, pot, grass, hash, etc.)?
2. Cocaine (coke, crack, etc.)?
3. Amphetamine type stimulants (speed, Crystal meth, diet pills, ecstasy, etc.)?
4. Inhalants (nitrous, glue, petrol, paint thinner, etc.)?
5. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)?
6. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)
7. Opioids (heroin, morphine, methadone, codeine, etc.)?

If the initial response is positive, the eCHAT asks “In the past three months, how often have you used Cannabis (marijuana, pot, grass, hash, etc.)?” A “Never” response leads to a question about the next drug type. If the response is positive there are six questions for each drug type following the same pattern as the ASSIST alcohol questions, with the same scoring (see Section 9.3.4.2 above). Positive responses to the non-prescription or recreational drug use questions trigger the Help question. We changed some of the US vernacular terms for illicit drugs to their NZ equivalents (for example we replaced Crystal meth with “P”).

9.3.4.4 eCHAT and gambling
Because gambling is low prevalence, and because it may take many forms (pokie machines, scratch cards, cards or mah-jong, casino games, internet gambling, betting on horses or greyhounds), if someone identifies a gambling issue we elected not to have a scored test at this stage. Initially it is better to identify the form and frequency of the gambling and the consequences it is having on a person’s life (to their finances, their relationships and their employment) as well as co-existing issues identified in eCHAT domains. Assistance can then be offered including referral to gambling treatment programmes. A scored test such as the SOGS20 could be incorporated into the eCHAT should this be required in the future. Positive responses to the CHAT gambling questions trigger the Help question.

9.3.4.5 eCHAT and depression
The first two questions of the eCHAT for depression are the PHQ-2: “Over the last 2 weeks, how often have you been bothered by little interest or pleasure in doing things?” and “Over the last 2 weeks, how often have you been bothered by feeling down, depressed, or hopeless?” with the options of “Not at all”, “Several days”, “More than half the days” or “Nearly every day”.

If the respondent answers no to both questions the eCHAT skips to the anxiety question. If there is a positive response then the remaining seven questions of the PHQ-9 are presented. The PHQ-9 score of depression severity ranges from 0 to 27:

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>None</td>
</tr>
<tr>
<td>5-9</td>
<td>Mild depression</td>
</tr>
<tr>
<td>10-14</td>
<td>Moderate depression</td>
</tr>
</tbody>
</table>
15-19  Moderately severe depression
20-27  Severe depression

A positive response to the last question ("Over the last 2 weeks, how often have you been bothered by thoughts that you would be better off dead or of hurting yourself in some way?") also raises a red flag ("**ALERT** Positive to self-harm). Positive responses to any depression questions trigger the Help question.

9.3.4.6  **eCHAT and anxiety**
Since the validation of the CHAT, the seven-item anxiety scale (GAD-7) has been shown to be a reliable and valid tool. A positive response to the CHAT anxiety question activates the GAD-7. GAD-7 scores range from 0 to 21 with ≥ 8 a positive score for general anxiety and panic disorders, post-traumatic stress disorder (PTSD) and social phobia. Positive responses to the CHAT anxiety question or GAD-7 questions trigger the Help question.

9.3.4.7  **eCHAT and abuse or loss of anger control**
Because either abuse or loss of anger control are relatively low prevalence, there are not simple scored tests available and because the nature of the relationship and the possible aggressive or abusive act being experienced or perpetrated need to be sensitively explored, these questions in the eCHAT do not lead to scored tests. Positive responses to either of the two CHAT abuse questions or the anger control question trigger the Help question.

9.3.4.8  **eCHAT and physical inactivity**
The screening question is "As a rule, do you do more than 30 minutes of moderate or vigorous exercise (such as walking or a sport) on 5 days of the week?" If people indicate that they are relatively physically inactive the Help question is activated. Again there is no simple scored test for sedentary behaviour. What is generally required is a conversation to clarify the types and quantity of exercise that someone is achieving, exploring the possible options for increasing this (including different types of exercise, intensity and duration) and providing a green prescription if this is indicated.

9.3.4.9  **Overall specifications of the eCHAT content**
An eCHAT document was produced with the full repertoire of questions to be presented at the patient interface, with instructions of which were unconditional and which were conditional, with all possible branching options presented. Another set of specifications were drawn up for the summary screen to be seen by the GP, with criteria and what to be displayed for each eCHAT domain.
9.3.5 Development of the patient interface of the eCHAT

We chose a one-question-per-screen design, as used in the severe mental illness PAS,\(^4\) because this allows the patient to focus and provides screen "real estate" for large fonts and buttons (much like an automated banking machine). However, unlike the PAS, we opted against a complementary audio presentation of the question as we felt it impractical for most NZ general practice settings. We assume that the system can be situated in the waiting room such that the patient receives adequate privacy by having the patient somewhat out of the way of main patient seating (for example, with their back to a wall or using a kiosk) or using a more private device such as a tablet PC.

The patient needs to be identified by the system in order for their eCHAT records to be matched with their electronic medical record in the PMS. Although the unique NHI identifier would achieve this, most patients do not know their NHI and the receptionist would need to either enter this or provide it for the patient on paper. We therefore opted for login to the eCHAT using the patient's first and last names and their date of birth. After we had conducted testing in the health informatics laboratory, we ran preliminary field assessments. Usability issues were identified and an initial multi-field screen design was changed to one field per screen. Also because not all patients are familiar with using a keyboard so both alphabetical and QWERTY keyboard versions were offered and the system programmed to flexibly and correctly identify names with hyphens, spaces and apostrophes. This redesigned version has first given name requested on one screen and surname on the next (with given name still displayed, but editable only by going ‘Back’ to the previous screen). The resulting screen design is shown in Figure 9.5.
Figure 9.5 Patient Self-Identification via Touchscreen (Illustrating One-Field-per-Screen Interaction)

Figure 9.6 illustrates a typical patient question presentation – in this case, one that appears after the patient has indicated that they are a smoker. There are options to go back to correct a response and to finish early, if the patient gets called into the consultation.

Figure 9.6 A Typical eCHAT Patient Question Presentation for the Touchscreen Display
We used an approach of iterative feedback and refinement to attune the patient interface screen to patients' needs. After initial development, we sought feedback from the research team and other staff of the Department of General Practice and Primary Health Care in a laboratory setting (Health Technology Laboratory of the National Institute for Health Innovation). This informed minor modifications prior to field study. The eCHAT was sequentially field tested in two Auckland general practices. In both cases this involved identifying a location for the touchscreen system and upgrading the PMS software to recognise the eCHAT inputs (which, in most respects, is little different from adding any other form to the system).

Consecutive adult patients (over 16 years of age) were recruited by a research assistant from the general practice waiting room. Exclusion criteria were those who were unable to communicate in English or had impaired mental status (such as dementia) to the extent that they could not meaningfully participate. Those who consented to participate sat at the touchscreen terminal, identified themselves to the system by name and date of birth and then undertook the eCHAT. Patients could ask the research assistant for help if necessary, or withdraw if they found the line of questioning unacceptable. It was explained that they should exit if called to see the GP before completing the interview (and, moreover, the system would exit and submit their work to the PMS if left idle for more than one minute).

After their eCHAT consultation, patients completed a feedback survey regarding their experience of the system, whether questions were understandable and acceptable, and to provide any other comments on problems and possible improvements. Patients were recruited in the first practice until systems-related problems were minimised (with active revision of the system configuration as necessary). The field study then moved to the second practice to recruit further patients for their feedback. This stage ended in late 2009.

9.3.6 Development of the GP interface of the eCHAT

The results for the eCHAT are available to the GP as a summary for each of case-finding domains (tobacco use, alcohol use, other drug use, gambling, depression, anxiety, abuse, anger control and physical inactivity). Negative results are displayed in black (for example, Non-drinker or Drinking no problem). Positive results are displayed in blue. These may include the risky behaviour (for example how many cigarettes smoked per day), positive responses to the eCHAT question(s) (for example, feels need to cut down), summary results and interpretation of any additional triggered tests (for example ASSIST smoking score 20, risk to health) and whether the patient wants help (either today or later). An example of the summary in the MyPractice PMS can be seen in Figure 9.7. Below the summary table are the eCHAT questions as completed by the patient. If the eCHAT has not been fully completed then the GP can ask the patients the questions and complete during the consultation.
All practice staff involved (GP, nurse, receptionist, practice manager) underwent semi-structured audiotaped feedback interviews either face-to-face or by telephone. The electronic audio-files were transcribed and underwent thematic analysis using a general inductive approach to identify key themes and issues.

Figure 9.7 eCHAT Summary Screen as Viewed by GP in Consultation with Patient

9.3.7 Integration between the patient and the GP interfaces

Direct integration from the touchscreen or other application to the PMS software was set up through the local practice IT network (either by cable or wireless).

9.3.7.1 Touchscreens

We purchased two different touchscreens for the project. Both are PCs running Microsoft Windows XP with the touchscreen technology functioning as a mouse (from the application programmer’s and the user’s perspectives). In one the touchscreen display and the PC system are embedded a single casing, whereas in the other the computer is discretely placed behind the touchscreen.
9.3.7.2 PMS vendor

There are several different PMS vendors in NZ. The majority of the market share is held by MedTech32\textsuperscript{454,455} with other systems including MyPractice\textsuperscript{456} (designed by GP Dr Ashwin Patel), Houston\textsuperscript{457} and Profile.\textsuperscript{458} Our initial negotiations were with MedTech32 to pilot eCHAT. However after one year this had failed to eventuate. We therefore decided to contract MyPractice for our feasibility study using a touchscreen. There were initial technical issues with the touchscreen system losing its connection to the PMS that were resolved. The workflow supported by our solution is illustrated in Figure 9.8.

![Figure 9.8 Integrated eCHAT / PMS Workflow](image)

9.3.7.3 Evaluation of the touchscreen to PMS interface

A semi-structured interview of the GPs of the practices along with vendor and researcher representatives identified system issues from the GP perspective. Subsequent to these findings the system was further modified.

9.3.8 Results of feasibility study

9.3.8.1 Results of feedback on patient interface

Recruitment proceeded smoothly with 30 patients recruited at the first practice and, once the system was deemed to be performing smoothly from a technical perspective, 23 patients recruited at the second practice. In total, 51 of the 53 patients who used the eCHAT completed the feedback survey. Key findings are summarised in Table 9-3.
Table 9-3 Summary of Survey Responses from Patients using eCHAT on Touchscreen in Waiting Room

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you find the touch screen easy to use?</td>
<td>45</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(88%)</td>
<td>(10%)</td>
<td>(2%)</td>
</tr>
<tr>
<td>Did you find all the questions clearly phrased and easy to understand?</td>
<td>43</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(84%)</td>
<td>(14%)</td>
<td>(2%)</td>
</tr>
<tr>
<td>Do you think that this is an appropriate thing for your GP to be offering?</td>
<td>46</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>(90%)</td>
<td>(6%)</td>
<td>(4%)</td>
</tr>
<tr>
<td>Are there any questions you object to being asked?</td>
<td>1</td>
<td>49</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(2%)</td>
<td>(96%)</td>
<td>(2%)</td>
</tr>
<tr>
<td>Did you have any concerns about privacy with the process?</td>
<td>0</td>
<td>45</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>(0%)</td>
<td>(88%)</td>
<td>(12%)</td>
</tr>
<tr>
<td>Did the GP have access to your responses during the consultation?</td>
<td>24</td>
<td>7</td>
<td>14  + 6</td>
</tr>
<tr>
<td></td>
<td>(47%)</td>
<td>(14%)</td>
<td>unsure*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(27% +11%)</td>
</tr>
<tr>
<td>Did you discuss any of your responses on the touch screen during your consultation with your GP?</td>
<td>13</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>(25%)</td>
<td>(53%)</td>
<td>(22%)</td>
</tr>
<tr>
<td>If yes, did you find this helpful?</td>
<td>9 **</td>
<td>2 **</td>
<td>2 **</td>
</tr>
<tr>
<td></td>
<td>(70%)</td>
<td>(15%)</td>
<td>(15%)</td>
</tr>
</tbody>
</table>

* 6 patients wrote in “unsure” or “don’t know” for this question
** Only includes responses from those 13 who had answered yes to the prior question

An additional 19 patients declined to participate in the follow-up – reasons given are summarised in Table 9-4.

Table 9-4 Reasons Patients gave for Declining Participation in the Follow-up Survey

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not comfortable with questions</td>
<td>3</td>
</tr>
<tr>
<td>Time constraints – didn’t want to be held up after consultation</td>
<td>2</td>
</tr>
<tr>
<td>Feeling unwell</td>
<td>1</td>
</tr>
<tr>
<td>Hard of hearing (uncomfortable to participate)</td>
<td>1</td>
</tr>
<tr>
<td>Mental illness</td>
<td>1</td>
</tr>
<tr>
<td>Not interested</td>
<td>1</td>
</tr>
<tr>
<td>Happy with transferring this info to GP verbally</td>
<td>1</td>
</tr>
<tr>
<td>No comment made</td>
<td>9</td>
</tr>
</tbody>
</table>

The patient feedback has driven a number of minor revisions to improve question wording and flow.
Further patient field testing was planned. However the grant had a finite duration of two years. Initial delays in contracting for the IT system development and time needed to make the various adjustments indicated by feedback obtained meant that the funding expired before field testing was complete.

9.3.8.2 Results for feedback from GP users
The focus group identified that a compact summarisation of the patient’s eCHAT results for the GP was essential to usability in the consultation. eCHAT reviews several domains and the full set of questions with their responses yields a display that must scroll (or tab) to fit the display real estate. The resulting solution was to provide the summary at the top of the form display with clear signals as to areas where issues are arising, scores and their interpretations for the validated instruments incorporated into eCHAT (for example the PHQ-9) and indication of patient help request status – see the screen shot Figure 9.7.

9.3.9 Discussion on eCHAT feasibility study

9.3.9.1 Summary of findings of eCHAT feasibility study
We have taken a lifestyle and mental health self-assessment tool that has been validated in paper format (the CHAT) and adapted it for online delivery in the general practice environment. The resulting eCHAT is delivered via a touchscreen interface for the patient in the waiting room and provides the data in an integrated format into the PMS software for review by the GP during consultation. The eCHAT is found to be usable and acceptable by patients in this setting. We have made further refinements, particularly to the GP summary presentation. Our planned next step is an RCT to evaluate quality-of-life gains. It is anticipated that having a tool to support wide-scale case-finding of risky health behaviours and negative mood states of the adult population will significantly enhance awareness and hence management of patient lifestyle and mental health in general practice.

Patients find lifestyle and mental health screening in the general practice waiting room via a self-administered touchscreen interface to be acceptable and usable. This can be technically integrated with the general practice PMS database, but GPs require succinct summarisation of the findings in order to use them effectively during consultation with the patient.

Opportunistic screening in the general practice setting is likely to have limited effect compared with routine screening by invitation.26 Given consultation time restraints, compliance with routine screening regimes can be low for both patients and practitioners.27,28 For this reason, the pre-consultation self-administered eCHAT as a tool for routine use with adults attending general practices offers huge promise to boost the detection and management of lifestyle and mental health issues in the community.
9.3.9.2 Strengths and limitations of the eCHAT feasibility study

Given the acceptability and validity of the paper-based CHAT, and the success of touchscreen based self-administered patient assessment systems in primary care settings internationally, it is unsurprising that an eCHAT system is feasible in the NZ general practice setting. However, the experience of the initial field studies and focus group reported here illustrate the value of careful iterative feedback even when the pathway appears quite clear. Initial problems, such as those we encountered with the patient self-identification dialog or the summarisation of findings to GPs on their PMS display and subtle issues around question phrasing and flow, could easily advance undetected in a system rushed to production use or large-scale trial.

While we have found the system to be acceptable, we must acknowledge the non-trivial percentage of patients who declined to participate (26%). It is unclear how this rejection may apportion between an unwillingness to participate in the research study (requiring reading a participation sheet, signing a consent form and completing a feedback survey) as compared to a rejection of an online lifestyle and mental health survey per se.

Being able to implement and field test in MyPractice but not in the mostly commonly used PMS, MedTech-32A, was a major limitation. Furthermore we ran out of time and hence were unable to field test the revision of eCHAT revised in response to patient and GP feedback. Our results are based only on two non-randomly selected practices and broader GP feedback in particular will be valuable.

9.3.9.3 Conclusion of eCHAT feasibility study

This is a feasibility study which proceeds a planned RCT that will assess quality-of-life improvement over six months for patients having an eCHAT interview in general practice as compared to those who do not. Further funding is being sought for an RCT assessing the change in GP diagnosis and the effect of systematically using the eCHAT on patient outcomes. The prevalence of three of the conditions for which we are including a reference standard, problematic drinking, depression and anxiety, are 10 to 12%. The lowest prevalence for the domains being assessed is gambling at 2%.

Health outcome measures for the RCT will include health-related quality of life (HRQOL) measures for example improvement in depression scores). Because the feasibility study addressed the practical aspects of the process of integrating the CHAT electronically into the PMS and did not include patient follow-up, it was not designed to gather information to help power the proposed RCT. Power calculations for the subsequent power will be based on an anticipated 10% improvement in health outcomes and will need to take into account the clustering effect ie it will be a clustered randomised trial with each enrolled practice being a cluster. This clustering will reduce the study power. The inflation factor = 1 + ICC x (C -1) where
C is the clustering coefficient. Powering the planned RCT is beyond the scope of the feasibility study.

As a further direction, the eCHAT could be extended with minimal modification for availability as a Web browser and/or mobile phone based service. It is also worth noting that a number of implementations of instruments with similarity of eCHAT are already available in NZ. Standardisation with the validated version would be highly desirable both to maximise evidence based effectiveness and to support comparability of data.

The net outcome of the project is a tool that is nearly ready for more substantial roll-out and evaluation. We are seeking support through the MOH for uptake and further field evaluation through DHBs and PHOs. Having an eCHAT available will allow accurate evaluations of the prevalence of the relevant conditions in primary care communities and inform research to assess changes in patient outcomes when such a tool is systematically applied to a practice population.

### 9.4 Web-based version of the eCHAT

Preliminary work has been undertaken in the development of a web-based eCHAT. In this version the patient completes the eCHAT located on a website via an iPad with the results either emailed to the GP (‘push technology’) or accessed by the GP from the website (‘pull technology’) as illustrated in Figure 8.5. This work was conducted by Mr Anil Thapliyal, CEO of HealthTRx, Auckland and his IT team between September and November 2010. When we commissioned the web-based version we had considered using touchscreens. However iPads were introduced into NZ at the end of July 2010 hence we made the decision to adopt this more portable technology. The eCHAT is currently hosted at [http://www.myhealthscreen.co.nz/](http://www.myhealthscreen.co.nz/).
9.4.1 Registration for the web-based eCHAT

Individual clinics can register on the site and staff members at the practice can be registered as doctor, nurse or administration staff. The results of the eCHAT can be assigned to a specific staff member. Patients enter their date of birth by touch screen (drop-down boxes) and their first and last names by touch keyboard on the iPad. Figure 9.10 shows a screen shot of the registration page.
9.4.2 Completion of the web-based eCHAT

The eCHAT then follows the same tree structure as the version designed for the touchscreen integrated into the MyPractice PMS (see 9.3.4). Touching an answer results in the next question being presented automatically. There are options to return to the previous page (to change an answer) or to finish early if called into a consultation. A screen shot example is presented in Figure 9.11.

![Screenshot example](image)

**Figure 9.11 Typical Patient Question Presentation for Web-Based eCHAT**

While this has been designed for iPad, other tablet PC or touchscreen self-administration in a waiting room, because this is a web-based application the eCHAT could be completed remotely wherever there is an internet connection. There is the potential for this to be done at home. For example, there is developing capability for patients to make their own appointments and access some of their health records. Medtech Global, the vendor for the PMS MedTech-32,\(^5\) has the optional functionality of ManageMyHealth (http://www.managemyhealth.co.nz/home.aspx). An invitation to complete the eCHAT could be delivered by such a system, with details provided so that the patient could log on to their own registered clinic.

9.4.3 Summary results of the web-based eCHAT

The assigned health provider (GP or practice nurse) will receive an email containing summary text of the eCHAT results, for example:
**ALERT** Positive to self-harm
[SMOKING] Smokes 11-20 per day | Feels need to cut down | ASSIST smoking score 24 = At risk (4-26 / 31) | Wants help today
[DRINKING] Drinking no problem
[OTHER DRUGS] Non-User
[GAMBLING] Non-Gambler
[DEPRESSION] Little interest or pleasure | Down or hopeless | PHQ9 score 14 = Moderate depression (10-14 / 27) | **ALERT** Positive to self-harm | Wants help not today
[ANXIETY] Not anxious
[ABUSE] No abuse
[ANGER CONTROL] No problem
[INACTIVITY] Physically active

In this example in the response to the last of the PHQ-9 questions (“Over the last 2 weeks, how often have you been bothered by thoughts that you would be better off dead or of hurting yourself in some way?”) the patient has indicated “More than half the days” and this has triggered an alert regarding self-harm. The message **ALERT** Positive to self-harm is present both in the report emailed to the GP and in the report accessed via the website.

The practitioner can also log onto the website and access the report for that patient (see Figure 9.12). There is also an option to Resume the questionnaire. If the patient has finished early, clicking this button will lead to the next question to be answered and the patient and practitioner can then complete the eCHAT together.

**Figure 9.12 Web-Based eCHAT Summary Screen as Viewed by GP**
Further directions for web-based eCHAT

Further field testing is required. Funding is being sought for additional functionality of the web-based eCHAT. This includes addressing security and encryption issues and for better integration of the web-based system into the PMS, particularly the leading vendor MedTech-32. The web-based eCHAT will then be available for implementation.

While the initial touch screens used Windows XP, the current version of eCHAT is administered on an iPad which uses an Apple operating system. However it can also be administered on a personal computer or a mobile device and its use is hence independent of the hardware device used to complete it.

While the initial touch screen version was designed to integrate with MyPractice, the initial web-based, iPad-administered version could be used by GPs using any PMS, because results were accessed through a web-site and via email. The current version of the web-based eCHAT now integrates into MedTech classifications and screening fields using an advanced web-based form.

Integrated decision support

Case-finding of risky lifestyle behaviours or mental health issues requires management. With electronic systems one-click links to decision support can be provided. There are a number of interventions which are common to assist people to make changes towards healthier behaviours or move towards more positive mood states. There are also a number of possible specific interventions that are specific for each condition. A number of suggestions are outlined which may be incorporated in decision support but are not inclusive.

Generic interventions

A number of approaches are generic. For all eCHAT domains the practitioner and the patient can discuss the issues and decide what if any interventions might be suitable and chosen. For all conditions specific information sheets can be either printed or emailed to the patient. Practitioners may assist patients using goal-setting techniques, problem-solving, motivational interviewing, cognitive behavioural therapy (CBT) techniques, schedule further appointments or provide referrals to other practitioners or agencies. GPs and practice nurses can be trained to deliver brief CBT effectively, which can also be delivered by community providers such as social workers. There is some evidence that providing easy referral pathways to community-based psychological services has positive outcomes.

Helping patients to find positive meaning (such as reframing adverse events in a positive light, infusing ordinary events with positive value and pursuing and attaining realistic goals) has been
shown to improve long-term psychological well-being. Loving-kindness meditation has been shown to increase life satisfaction and reduce depression, and this is a simple to teach.

Depression, anxiety and medically unexplained symptoms all occur on a spectrum of severity, are manifestations of distress or not-flourishing, and all will have the same types of interventions to move people towards more positive mood states - acknowledge the distress, provide a structured programme of support, problem-solving, goal-setting, brief psychological interventions and medication where indicated and chosen.

9.5.2 Examples of interventions for smoking cessation

A brief intervention using the ABC approach prompts health care workers to Ask about smoking status; to give Brief advice to stop smoking to all smokers and to provide evidence-based Cessation support for those who wish to stop smoking. Effective cessation support may include:

- Giving practical help in planning strategies and supports, including setting a target quit date.
- Assessing the degree of nicotine dependence, which will help guide treatment (already provided by the ASSIST tobacco use score from the eCHAT).
- Recommending/prescribing stop-smoking medication (such as nicotine replacement therapy, bupropion, varenicline or nortriptyline).
- Arranging follow-up consultations.

Patients may be given the toll-free Quitline telephone number (0800 778 778). This is a national telephone service for people who want help in stopping smoking. The service provides support over the telephone and offers subsidised nicotine replacement therapy. Telephone counselling has been shown to be effective in smoking cessation. Other options include mobile-phone based interventions or electronic cigarettes, an odourless and flameless clean nicotine delivery system with the appearance of cigarettes but do not produce smoke.

9.5.3 Examples of interventions for problematic drinking

Brief interventions can be effective for dealing with risky and binge drinking. Patients can be assessed with regard to their readiness to change, and the general principles of motivational interviewing applied:

- Express empathy by accurate listening that clarifies the patient’s experience, feelings and interpretations.
- Amplify discrepancy between current behaviour and broader goal by weighing pros and cons.
- Arguments are counterproductive and breed resistance.
• When faced with resistance, review patients’ readiness to change.
• Support belief in the possibility of change. The patient is responsible for choosing and carrying out change.

Cognitive behavioural coping skills treatment can also be effective. Additionally the 12-Step facilitation approach to assist those with drinking problems in using self-help programmes such as Alcoholics Anonymous (AA) may help some people. A member of the patient’s family or friend may be enlisted to help. Dependent drinking may require referral for detoxification at the various community agencies available. Drugs such as Antabuse (Disulfiram) and Naltrexone may be effective for some patients.

9.5.4 Examples of interventions for substance misuse
Similar brief psychological interventions using principles of motivational interviewing and CBT may assist patients to stop their use of non-prescription or recreational drugs. The 12-Step programme Narcotics Anonymous (NA), on the same model as AA, may be helpful, and the other interventions recommended for problematic drinking, including referral for detoxification, are all relevant for addressing other substance abuse.

9.5.5 Examples of interventions for problematic gambling
As well as the brief interventions outlined above for other addictive behaviours, there may be specific problem gambling treatments available on referral. The Gambling Helpline (New Zealand) is a 24 hour Freephone service available by phone (0800 654 655), text (8006) or email (info@gamblinghelpline.co.nz). The Problem Gambling Foundation also provide a free hotline (0800 664 262), assistance by email (help@pgfnz.org.nz) and face-to-face counselling.

9.5.6 Examples of interventions for depression
While most countries have national guidelines for treating depression, these have limitations in general practice where the severity of the symptoms, the attributes of the patient and the context need to be taken into account, and the patient and doctor need to jointly make a plan of action. Non-pharmaceutical interventions that may be effective for treating depression include short-term psychodynamic psychotherapies such as CBT, problem-solving treatment provided by GPs, mental health workers delivering psychological therapy and psychosocial interventions in primary care settings, telephone counselling and exercise programmes.

Young people can be referred to the NZ government the lowdown website (www.thelowdown.co.nz) and older adults to the My journal self-help website (www.depression.org.nz) or given the Depression helpline toll-free number (helpline 0800 111 757). CBT may also be available online. Antidepressant medications include TCAs, SSRIs and Serotonin–norepinephrine reuptake inhibitors (SNRIs) such as venlafaxine. Atypical TCA
Bupropion, a norepinephrine-dopamine reuptake inhibitor, can also be effective as a smoking cessation agent.

9.5.7 Examples of interventions for anxiety

As for depression, brief psychological interventions including CBT and problem-solving can be effective treatments for anxiety. The Computer Assisted Learning for the Mind CALM website www.calm.auckland.ac.nz/ provides a number of resources including audiotapes of practical techniques for managing stress, including mindfulness, coping plans, progressive muscle relaxation and self-hypnosis. Antidepressant medications including TCAs, SSRIs and SNRIs may also be effective for anxiety as well as anti-anxiolytics such as benzodiazepines and α-adrenergic-antagonists (α-blockers).

9.5.8 Examples of interventions for abuse and for anger control

As well as the health professional discussing the circumstances with the patient and jointly working out a plan of action, there are a large number of community (government and non-government organisations) to which referrals can be made or contact details given. These include national organisations such as Age Concern (www.ageconcern.org.nz), Relationship Services (www.relate.org.nz), victim support (www.victimsupport.org.nz) and women’s refuges (www.womensrefuge.org.nz) or counselling services such as Home and Family (www.homeandfamily.org.nz) as well as many regional resources. More generic services such as Lifeline (www.lifeline.org.nz) and Youthline (www.youthline.co.nz) offer assistance. Lifeline offers free counselling by phone (0800 543 354) and face-to-face. Youthline can be contacted by toll-free phone (0800 37 66 33), free text (234), email & MSN (talk@youthline.co.nz). The CALM website (www.calm.auckland.ac.nz) also offers resources to deal with anger and reduce conflict in relationships.

9.5.9 Examples of interventions for physical inactivity

The primary intervention for sedentary behaviour is the Green Prescription (GRx). This is a written, goal-orientated exercise prescription given by GPs or practice nurses to sedentary patients, it is viewed as a tangible reminder to a patient of an exercise plan arrived at by joint discussion between patient and health professional, with the expectation that it will be more effective in increasing the patient’s level of exercise than verbal advice alone. A GRx specifies the number of minutes and number of times a week that a patient should go for a brisk walk or engage in some other physical activity to be determined by the practitioner and the patient. The script is either hand-written or issued electronically through the PMS.

If the patient wants on-going support, the script can be forwarded through to the nearest GRx Patient Support Person. Regional GRx contacts can be found at
This allows patient contact with a local Regional Sports Trust staff member to discuss their exercise programme and can encourage the patient to become more active through:

- Monthly telephone calls for 3-4 months or
- Face to face meetings for 3-4 months or
- Group support in a community setting for 3-6 months.

Support can be provided by the GRx Patient Support Person by phone and the Prescription also offers a toll-free number (0800 ACTIVE (0800 22 84 83). The patient's progress on their path to an active lifestyle is reported back to the referring health professional. If the patient feels they would benefit from on-going support, they are encouraged to ask their health professional for another GRx.

### 9.6 Future directions for eCHAT

Although the CHAT was originally developed as a paper tool, the intention from the outset was for its electronic administration and integration with decision support in the PMS, and 100% of the 51 GPs and practice nurses in the initial evaluation wanted the tool available in electronic format, either solely or dual electronic and paper. All on-going research and implementation is with the electronic version hence I will refer to it as the eCHAT from here on. Once the eCHAT is fully integrated into the PMS or EMR and appropriate decision supports such as those outlined above are incorporated, the eCHAT has huge potential in a variety of primary care and community settings, especially with vulnerable populations.

#### 9.6.1 Research proposals

A number of research proposals are being developed.

- I am currently co-investigator on a project led by Dr Shane Reti trialling a general practice based health kiosk using an iPad in an urban Northland practice (Auckland National Ethics Committee approval number NTX/11/EXP/065). This project is studying the feasibility and acceptability of the iPad kiosk as well as the reconciling of patient-identified information with what is recorded in the electronic medical record. In this case the information regards allergies and medical warnings. However these findings can inform further eCHAT research and implementation, in which Dr Reti will collaborate.

- In NZ an application will be made to HRC in 2011 in conjunction with NIHI to conduct a pragmatic single-blind RCT comparing eCHAT case-finding and intervention with usual care to assess effectiveness of eCHAT with the primary measure as HRQOL.
I am working with Professors Lillian Gelberg, Ron Anderson and William McCarthy from UCLA, California on a research proposal to conduct feasibility and acceptability study and a pilot three-arm RCT (eCHAT with integration to clinician, eCHAT alone and usual care) adapting eCHAT in the US primary care setting with vulnerable populations. Funding proposals are being prepared for the National Institute on Drug Abuse (NIDA) and for the Agency for Healthcare Research and Quality (AHRQ). The setting will be two Community Health Centre "safety-net" clinics in Los Angeles. The Veterans Administration (VA) of Greater Los Angeles and University of California, Los Angeles is also looking at piloting the eCHAT in two of their clinics – one primary care and the other for the homeless. This project includes the eCHAT translation into Spanish for use with Latino American populations.

Dr Natalie Walker from Clinical Trials Research Unit, School of Population Health and I are applying for an HRC of NZ Community-Based Primary Healthcare Networking Grant for Collaboration with Canadian Researchers. Our collaboration would focus on development of a multicentre clinical trial of an intervention to improve access to appropriate community-based primary healthcare for vulnerable populations. We are looking at trials of the eCHAT in collaboration with Dr Selby, Clinical Director, Addictions Program, Departments of Family and Community Medicine, University of Toronto and with Professor Martin Dawes, Chair of Department of Family Medicine at the University of British Columbia.

9.6.2 Implementation projects

A proposal is currently under consideration by Health Workforce NZ (HWFNZ) and the NZ MOH to pilot use of eCHAT in two practices. This will include integration into MedTech-32 PMS. The objectives of this proposal are to reduce the large data entry burden on general practitioners (GPs) and other staff in the practice, to ensure that data collected from patients are complete and up-to-date, to ensure that patients’ data in the PMS are accurate and of high quality and to automate the collection and analysis of health information for case identification. One of the features will be that eCHAT responses will populate Smoking status in the Classification field of the PMS. The 2010 PHO Performance Programme (PPP) introduced additional performance indicators that focus on supporting smoking cessation. These require recording of smoking status using a standard Read Code, and if relevant, smoking cessation advice delivered for each patient in their electronic medical record. eCHAT will facilitate collection and recording of this information.

The Cook Inlet Tribal Council (CITC) is developing an implementation of the eCHAT in a community setting for young people in Anchorage, Cook Inlet, Alaska. The test results will direct wrap-around community-based programmes for addictive behaviours, mental health
issues and inter-personal violence. The introduction of the eCHAT in their new community facility will undergo extensive process and outcome evaluation.

9.7 Summary of Chapter 9

In this Chapter I have outlined a variety of national and international projects, both research and implementation of the CHAT tool that were instigated during the period covered by this thesis (2001 to 2010). My work with the CHAT continues and in 2010 preliminary work was undertaken to produce a fully integrated eCHAT with results available in the PMS and appropriate linked decision supports. A pilot study is described describing the feasibility and acceptability of a touchscreen-administered eCHAT integrated into the MyPractice PMS. Work was also conducted developing a web-based eCHAT which can be self-administered by patients on a tablet PC (such as an iPad), a touchscreen or on a PC computer. I also provide suggestions for both generic and domain-specific interventions that could be integrated with eCHAT as clinical decision supports.

Since beginning this thesis a number of potential opportunities for extending the eCHAT have presented themselves. I have concluded this chapter by outlining some of the current directions that the eCHAT may take with respect to both research and implementation, in NZ and overseas in primary care and community settings.
10.1 Outline of Chapter 10

In this chapter I outline the main findings of this thesis in relation to my initial hypotheses and address the strengths and limitations of this body of work. I describe other multi-item tools and explain the CHAT within the context of these. I explore the theoretical underpinnings of the eCHAT, how it fits with and extends some existing models of behavioural change and its contribution to international knowledge. I also discuss recent trends in patient-centred and integrated models of care and the contribution eCHAT can make in this context. Finally I explore some of the challenges eCHAT has raised, firstly with respect to IT considerations of incorporating eCHAT into NZ PMS, and secondly ethical concerns raised regarding possible discrimination people might encounter from disclosing sensitive information and having this recorded in their EMR.
10.2 Key findings of this thesis

Five research questions were posed at the beginning of this thesis:

1. Will a brief multi-item tool, either self or practitioner-administered, for identifying lifestyle problems and mental health issues acceptable and valuable to primary care and other community workers and their patients or clients?

2. Will generic questions about abuse and anger control embedded within a multi-item tool be more acceptable to patients than specific screening questions for inter-partner violence asked in isolation?

3. Will such a tool have good validity against a composite reference standard?

4. Will asking whether people want help with issues that they have indicated identify those who both need and want intervention?

5. Will an electronic version self-administered by the patient with the clinician receiving a summarised report be feasible, acceptable and useful for patients and primary care workers?

This thesis has addressed these five questions. Evaluation of the multi-item CHAT outlined in Chapter 6 was found to have a high level of acceptability by over 2500 patients and 51 primary care practitioners (GPs and nurses) involved in the assessment study. Less than 1% objected to the questions involving abuse and anger, which compares very favourably with objection rates to being screened for inter-partner abuse, which range from 7% to 52% in a variety of studies (see Table 2.1).

The validity of the CHAT proved good when tested against a composite gold standard (Chapter 7), with the exception of the questions for eating disorders, which appeared to be measuring something significantly broader than an eating disorder per se and have since been removed from the tool. The exercise question has been reformatted so that the ‘yes’ response is to the left, in line with the ‘no’ responses for the other domains, because a ‘yes’ response to the exercise question indicates that a person is physically active, and this has reduced confusion in answering this question.

The Help question has been shown to increase the specificity of the test and hence improve identification of those who need intervention with respect to risky health behaviours or negative mood states, as well as allowing patients to indicate with what and when they would like assistance (Chapter 8).

Lastly we have developed two versions of the eCHAT and have conducted preliminary feasibility and acceptability testing. This work is continuing and versions of the eCHAT are being developed for a number of different settings.
10.2.1 Strengths of the thesis

This thesis describes the development, evaluation and validation of the CHAT. While they have been a number of occasions where mental health and or lifestyle behaviour questions have been combined for either clinical or research use, there are no other tools available that are similar to the CHAT or eCHAT. This novel tool is generic both with respect to the practice populations in which it is used and its whole-person, non-disease directed orientation – it is designed to be used with both male and female adults of any age or ethnicity in primary care or community settings. Rather than focus on a specific diagnosis (such as depression or drug dependency) the eCHAT is aimed to identify areas of need with respect to mood or risky lifestyles and help people to move along the spectrum towards more positive feelings and behaviours.

Strengths of this thesis include the robust development and evaluation of the CHAT in different settings with ethnically diverse populations. A key strength is the criterion validation of the CHAT with 1000 primary care patients. The most important contribution this body has made is introducing the innovation of the Help question which has been found to improve the positive likelihood ratios of the test as well as providing a patient-centred approach of identifying and prioritising issues and behaviours patients wish to address. The Help question now is being adopted in other contexts. Professor Chris Dowrick identifies strong scientific and ethical reasons for using the Help question. He writes “Scientifically, adding this help-seeking question to the two screening questions for depression improves… the specificity of a family physician’s diagnosis of depression. Ethically, it reminds us that our patients’ concerns and desires should be at the heart of our medical practice.”

The CHAT embodies many of the principles of the Alma-Ata declaration. As a self-administered tool which invites respondents to consider whether they want help with any potential issues it raises, it promotes self-reliance and self-determination. It can be offered or administered by a range of primary care providers including physicians, nurses and community workers. Because it addresses a number of lifestyle behaviours as well as disturbed mood, its use informs patients that primary care services are concerned about social and community activities that impact on their lives and their health.

10.2.2 Limitations of the thesis

The question still to be answered is whether the systematic use of the eCHAT in primary care settings leads to better health outcomes for our patients. RCTs in both NZ and in the US plan to test the hypothesis that case-finding and offering interventions for these inter-related lifestyle and mental health issues will improve people’s health well-being.
Limitations to the feasibility study of the eCHAT were that we were unable to integrate it with the leading PMS, MedTech-32, and we did not complete our field testing following our revisions following patient and GP feedback. We anticipate progressing this through our future proposals.

10.3 Multi-item screening and case-finding instruments

The knowledge that addictive and mental disorders often co-exist has grown significantly in recent years and there has been a move from single condition instruments towards screening or case-finding tools assessing several mental health issues such as a depression, anxiety and somatisation, for generalised distress, for serious mental illness and for mental illness and trauma. The PRIME-MD diagnoses depression, anxiety, and somatoform, alcohol and eating disorders (see Section 4.6). Kroenke et al have combined two-item ultra-brief screeners for depression and anxiety to create the Patient Health Questionnaire for Depression and Anxiety (PHQ-4). The Four-Dimensional Symptom Questionnaire (4DSQ) is a self-report questionnaire that has been developed in primary care to distinguish non-specific general distress from depression, anxiety and somatisation. The Kessler Psychological distress Scale (K10) is a 10-item test assessing non-specific distress which may be positive where patients are sub-threshold for depression or anxiety diagnoses. However none of these tools also assess risky health behaviours.

There has also been recognition of the value of combined screening for substance use (tobacco, alcohol and other drugs) and for other risky lifestyle behaviours. For example, the Life Style Questionnaire (LSQ) combines a number of existing tools plus clinical measurements to assess smoking, alcohol use, physical activity, eating habits and body mass index in cardiology out-patients, and the "HEADSS" technique involves use of a chart stamp (Home, Education, Alcohol, Drugs, Smoking, Sex) to prompt screening questions about home, education (or employment), activities, drugs, sexuality and suicide for young people. Furthermore there have been some attempts to look for both problematic mood and behaviour in specific populations, for example depression and lifestyle-related questions in antenatal patients or mental distress in women undergoing treatment for substance abuse.

Case-finding tools have been developed for multiple item clinical assessment or laboratory testing for specific populations such as elderly people, young people, pregnant women or those with specific medical conditions.

One study is reported in the literature that combined a number of tools (the Hospital Anxiety and Depression Scale, Quality of Life questionnaire (QLQ-C30), Mental Health Inventory-MHI5 and a Concerns Checklist) to assess clinically significant levels of distress among cancer patients in routine oncology practice which administered these via a touchscreen computer.
However none of these are generic primary care tools combining case-finding of both lifestyle factors and mental health issues. They deal with specific conditions (e.g., substance abuse, mental distress), disease states (e.g., cancer, heart disease) or populations (adolescents, the elderly, pregnant women). eCHAT is unique in its holistic, universal approach for all adults. By combining substance use, other risky health behaviours including violence and negative mood states, eCHAT recognises the inter-relationship of these domains, and how intervening in one can have positive effects on another (for example, increasing physical activity can reduce depression).\textsuperscript{126}

### 10.4 Theoretical models

The eCHAT is predicated on, and contributes to, a number of different theoretical models pertaining to health behaviour change.

#### 10.4.1 Health Belief Model

There has been a progression of models looking at behavioural change. An early model developed to explain and predict health individual health behaviours is the Health Belief Model (HBM)\textsuperscript{494 495} (see Figure 10.1). The HBM was based on the understanding that a person would take a health-related action if they perceived they were susceptible to getting a condition, that this condition was a severe risk to their health and that there were benefits to taking action which outweighed the barriers or costs. These concepts were seen as accounting for “readiness to act”. An additional concept “cues to action” activates that readiness and stimulates overt behaviour change. A further concept of self-efficacy (confidence in one’s ability to take action), drawing from Social Learning Theory, was added in 1988.\textsuperscript{496} As early as 1977, Bandura had identified the importance of self-efficacy (which he defined as “beliefs in one’s capabilities to organize and execute the courses of actions required to produce given attainments”) in mediating behavioural change.\textsuperscript{497}
By bringing people’s attention to the various domains that might affect their health, eCHAT raises patients’ awareness of their susceptibility to disease (influences their individual perceptions). The interaction with the clinician can bring into play modifying factors such as education and discuss of symptoms. The Help question of eCHAT promotes self-efficacy and wanting help immediately or at a later date gives an indication of likelihood of behavioural change. There also may be further people who identify issues they wish to attend to by using eCHAT but chose to address them themselves rather than seeking help from their clinician. The pre-consultation eCHAT paves the way for clinicians to assist patients identify their benefits and barriers to change and facilitate action.

**10.4.2 Stages of Change Model**

In 1991 Prochaska presented the Stages of Change Model, which described the dynamics of behaviour change from Pre-contemplation (no intention to change in the foreseeable future), through Contemplation (aware a problem exists, is thinking about it but not yet made a decision to take action), Preparation (have attempted to make changes and intend to do so in the future) to action (have successfully altered their behaviour) through to Maintenance (continuation of change, working to prevent relapse and consolidate gains). Finally there comes Termination, where the behaviour change has become stabilised with no temptation to revert to the previous unhealthy behaviour. This was later expanded into a Spiral Model of Stages of Change, with some people progressing in a linear fashion and others relapsing back to contemplation (Figure 10.2).
This model was subsequently integrated with a decision-making model which assumes that decision-making involves consideration of a “balance sheet” of comparative potential gains and losses which Prochaska called Decisional Balance. Using their trans-theoretical model, Prochaska and colleagues found commonality in the patterns of change across 12 behaviours: smoking cessation, quitting cocaine, weight control, high-fat diets, adolescent delinquent behaviours, safer sex, condom use, sunscreen use, radon gas exposure, exercise acquisition, mammography screening, and physicians’ preventive practices with smokers.

The Stages of Change and Decisional Balance Model overlaps with the HBM (10.4.1) which describes the challenges of changing unhealthy behaviours and its focus on readiness to change. The Help question assists patients to prioritise and identify domains in which they might be considering change, and facilities the patient – clinician conversation about readiness to take action.

### 10.4.3 Five A’s Behavior Change Model and Five R’s Motivational Model

The Stages of Change and the HBM focus on individuals making changes. Other models come from the perspective of how the clinician can assist patients to change. The Five A’s Behavior Change Model is an approach which has been used for a wide range of different behaviours and conditions (such as smoking cessation, physical inactivity and diabetic management) within primary care. It involves Assessing patients’ level of behaviour, beliefs and motivation, Advising them based on their personal health risks, Agreeing with them on a realistic set of goals; Assisting to anticipate barriers and developing a specific action plan and Arranging follow-up support, as outlined in Figure 10.3.
The ‘5As’ Model may be combined with the ‘5Rs’ Model applied to motivate patients: asking why making the behaviour change is personally Relevant, identifying the Risks of continuing with the unhealthy behaviour, the Rewards for making changes, the barriers or Roadblocks which might impede making the change and Repeating this motivational interview every time the patient consults. There are strong parallels between the ‘5Rs’ and the HBM: perceived susceptibility (relevance), threat (risk), benefits (rewards) and barriers (roadblocks). The 5th R (repeat) applies to the clinician motivating the patient at each visit rather than the individual making the changes. The NZ smoking cessation guidelines incorporated and simplified the ‘5As’ into the ABC memory aid: Ask about smoking status, give Brief advice to stop smoking to all smokers and provide evidence-based Cessation support for those who wish to stop smoking.

The ‘5As’ behaviour change principle is an evidence-based approach which outlines a sequence of support activities effective in helping people to change various health behaviours. These have been recognised also as applying at the practice level for designing activities to support behaviour change in patients and feasible to apply in primary care.

Again, these are the principles on which eCHAT is predicated. eCHAT is the assessment. The
The clinician receives a summarised report to facilitate discussion and feedback to the patient and allow the joint development of a plan of action. The clinician assists the patient identify benefits of and barriers to change and problem-solve. The primary care team approach allows for in-house follow-up and for referral to external agencies and services.

### 10.4.4 Self-Management

Patients managing their own health is an increasingly popular concept. The term self-management indicates that patients are active participants. Lorig and Holman identify six self-management skills—problem solving, decision making, resource utilisation, forming a patient—provider partnership, action planning and self-tailoring. The key is the individual’s active involvement. Problem solving means patients are taught basic problem-solving skills (not given solutions to their problems). Self-tailoring involves an individual applying self-management skills and knowledge appropriate to themselves and their circumstances. Lorig and Holman ascertain that successful self-management programmes require addressing the three tasks of medical, behavioural and emotional management. This is recognition of the inter-relationship of behaviours and emotions and how these should not be addressed in isolation.

Patients and their GPs together develop a Self-Management Action Plan which is modelled on the ‘5As’. Patients identify the behavioural change they need to make informed by and including all the ‘5As’ elements (Assess, Advise, Agree, Assist, Arrange) and including their rating as to how confident they are that they can complete their plan (a measure of self-efficacy). It can be seen how this approach melds elements of the Health Belief, Stages of Change, ‘5As’ and 5’Rs Models.

### 10.4.5 Chronic Care Model

A further development is Wagner’s Chronic Care Model (CCM) which offers a systems approach combining clinical management, psychological support, and information to facilitate effective self-management. The model identifies six elements of the health care system that can be modified for improving care – community resources, the health system, self-management support, delivery system design, decision support and clinical information systems. In combination these foster productive interactions between informed patients who take an active part in their care and clinicians who are equipped with resources and expertise.

Wagner’s CCM is reproduced in Figure 10.4, with the blue text indicating how eCHAT addresses the various elements in the model.
While originally designed to address the needs of the growing number of people suffering from major chronic illnesses, the CCM since has been expanded to incorporate health promotion and primary prevention.

10.4.6 Expanded Care Models

The past decade has seen a proliferation of expanded care models. For example, Ontario, Canada has a framework for preventing and managing chronic disease. This evolved from the CCM and then was informed by the Expanded Chronic Care Model from British Columbia, which incorporates the "Ottawa Charter of Health Promotion". The logic model for this framework is reproduced in Figure 10.5. It can be seen that it incorporates communities, individuals and their families and practice teams looking at not only outputs but also short, medium and long-term outcomes.

However these models still tend to be single-disease focused and do not fully meet the challenges of the complexity of managing individual patients who may have multiple existing chronic conditions requiring management and who also require screening, diagnosing new disorders and primary and secondary prevention of further diseases.
Figure 10.4 How the eCHAT Fits the Chronic Care Model (CCM) for Health Promotion / Disease Prevention for Development of a Self-Management Action Plan

(based on CCM development by MacCall Institute ACP-ASIM Journals & Books)
Figure 10.5 Logic Model for Ontario’s Chronic Disease Prevention and Management Framework
10.4.7 Fit of eCHAT with Models

eCHAT incorporates elements of the HBM by bringing a patient’s awareness of the threat of disease (such as the effects of cigarette smoking), cues action through education, facilitates appreciation of the benefit of making changes and addressing possible barriers through patient-clinician interactions such as problem-solving with the goal of increasing self-efficacy in self-care. eCHAT can be used to help move people along the path of change, with the questions raising people’s awareness of a health risk they can modify, and the Help question assessing where they are on the pre-contemplation to action continuum. Interaction with their clinician reviewing their eCHAT responses facilitates taking and maintaining action in the form of positive behaviour changes or interventions to improve negative mood states.

In particular, eCHAT fits well with the CCM, addressing all six identified mutable components of the healthcare delivery. Figure 10.4 illustrates the CCM and shows how eCHAT applies to the six components of patient care and practice improvement (organisation, clinical information systems, delivery system design, decision support, self-management and community resources) which are expanded below:

Organisational support which combines systems-level approach to assess needs of populations with individual patient care and can facilitate co-ordinated, integrated care across community clinicians. Once decision supports are integrated aggregated eCHAT data has value not just for following individual patients over time but also for practice performance evaluation and population needs assessment.

Clinical information systems are designed to facilitate efficient and effective care. Summarised eCHAT reports at the point of care can populate classification fields, lead seamlessly to decision supports incorporating guidelines, integrate with patient reminders and recalls and produce tailored information to facilitate self-care.

Delivery system design addresses the practice team approach including planned consultations, follow-up and case management. Where the eCHAT adds to the CCM is that it places the patient as an integral and central member of the team. Patients self-administer the eCHAT on a tablet computer or touch screen, with a summarised electronic report including the scores and interpretations of additional tools where these have been completed and alerts where relevant provided to the clinician in, or for insertion in, the PMS at the at the point of care. Once the patient has indicated risky health behaviours or negative mood states that they wish to address, collaborative co-ordinated on-going care can be facilitated calling by upon other members of the team such as the nurse or community pharmacist as well as other health professionals and nonprofessional team members.
Decision support requires evidence-based practice guidelines readily available in daily practice. Positive responses on eCHAT can have automatic links to relevant clinical decision-support tools and other evidence-based resources.

Self-management support is a critical component of the CCM. There is increasing evidence that interventions which support patient empowerment and attainment of self-management skills such as goal-setting, problem-solving and establishing management plans are effective in chronic conditions. The self-administration of eCHAT with the GP’s summarised report available at the point of care allows for the development of a proactive plan of care and a patient-clinician partnership with patients actively participating in decision-making and engaging in health self-management.

Community resources also play a role in the CCM. Again, eCHAT reports can link directly with a variety of community agencies and other resources. For example, community support services may be called upon to implement a green prescription, community health workers may provide telephone monitoring or patients may be referred to any number of community services such as drug and alcohol centres or community-based support groups.

10.5 Integrated models of primary care delivery

There is growing evidence that primary care helps prevent illness and death and is associated with a more equitable distribution of health in contrast to specialty care. International trends are towards more comprehensive and co-ordinated health services within the community.

The Alma-Ata Declaration of 1978 emphasised that health systems oriented towards primary health care produce better outcomes, at lower costs, and with higher user satisfaction. Alma-Ata principles were applied in the NZ Primary Health Care Strategy (PHCS) in 2001 which aimed for a primary care-led health system "with a greater emphasis on population health and the role of the community, health promotion and preventive care, the need to involve a range of professionals, and the advantages of funding based on population needs rather than fees for service." This concept has been extended in 2009 with the government Request for Expression of Interest “for the delivery of Better, Sooner, More Convenient Primary Health Care” aiming for large scale and transformational service improvement initiatives for a more personalised primary health care system providing collaborative services closer to home, making New Zealanders healthier and reducing pressure on hospitals by better managing chronic conditions and proactively supporting high need populations. Nine successful proposals currently are being piloted.
Other countries have similar initiatives:

- In England the Practice Based Commissioning reform is designed to give GPs and practice nurses more say in how the NHS provides services for patients, "with the intention that they will reflect their patients’ preferences, leading to greater variety of services from a greater number of providers and for more conveniences for their patients, as well as a more efficient use of resources", and practices combining together to commission services.\(^5\)\(^3\)\(^0\) There is also a strong move towards inter-disciplinary teams. The Royal College of General Practitioners (RCGP) is also forming the General Practice Foundation to support professional development of the team (including general practitioners, practice nurses, managers and physician assistants) and enhance levels of patient care.

- In Australia the regional Divisions of general practice are shifting to Primary Care Collaboratives and Medicare Local organisations. The Medicare Local scheme aims to “integrate and coordinate the range of organisations and service providers operating within primary health care, and to better link primary health care and other sectors”.\(^5\)\(^3\)\(^1\)

- Canada is similarly moving towards Canadian medical homes and integrated primary care network teams.\(^5\)\(^3\)\(^2\)

A parallel movement in the US is the ‘Patient-Centered Medical Home’ (PCMH), defined as "an approach to providing comprehensive primary care... that facilitates partnerships between individual patients, and their personal providers, and when appropriate, the patient’s family".\(^5\)\(^3\)\(^3\)

Many principles of PCMH are predicated on the CCM and include:\(^5\)\(^3\)\(^3\)-\(^5\)\(^3\)\(^5\)

- Patients having an on-going relationship with a personal physician trained to provide first contact, continuous and comprehensive care.
- A physician-led practice team approach; a whole person orientation with the personal physician responsible for providing for all the patient’s health care needs or arranging appropriate care with other professionals.
- Coordinated and/or integrated care across specialists, hospitals and community agencies.
- Quality and safety assurance by a care planning process, evidence-based medicine, clinical decision-support tools, performance measurement, active participation of patients in decision-making, information technology, a voluntary recognition process, quality improvement activities, and other measures.
- Enhanced access to care such as new options for patient – clinician communication.

eCHAT ticks most of these boxes. It is an efficient and cost-effective way of assessing patients’ lifestyle health risks. Because it is self-administered in the waiting room prior to the consultation it does not require consultation time to case-find lifestyle behaviours and mental health issues providing enhanced access for patients with their health team. Routine case-finding minimises the chance of missing opportunity to provide early health care. eCHAT puts the patient in the
centre and has a whole person orientation not a disease focus. The questions on the eCHAT application greatly enhance the potential for clinicians to accurately identify patient needs around sensitive mental health issues such as depression, domestic violence, alcohol and or drug use. In a fully-integrated eCHAT, information can be collected, analysed automatically and transferred seamlessly to EMR in real-time to be accessed by the clinician. The Help question allows patients to assess which any health behaviour changes they wish to make, and whether they want to take any action to improve their mood or health behaviours. Patients actively participate in decision-making and engage in self-management. eCHAT is cutting-edge technology supporting best patient care, education and communication and allows for performance measurement. It is an evidence-based initiative that has the potential for addition of a number of clinical decision-support tools to guide decision making, allows for rapid assessment of patient needs, the development of a proactive plan of care, facilitates communication between patients and providers, provides pathways to connect with community resources and combines a systems-level approach to assess needs of populations with individual patient care. It facilitates co-ordinated and integrated care across community providers.

Aggregated eCHAT data can be used to identify the overall population’s needs and to identify opportunities for improvement. DHBs could use these data for planning of service delivery. These activities enhance health care value and are core value-driving elements of the PCMH, hence the current interest in eCHAT from both clinical and research institutions in the US and Canada.536,533-535

### 10.6 Patient-centredness and decision-making

Berwick defines patient-centred care as “*The experience (to the extent the informed, individual patient desires it) of transparency, individualization, recognition, respect, dignity, and choice in all matters, without exception, related to one’s person, circumstances, and relationships in health care.*”537 Betchel identifies four key attributes: Whole-person care not disease-focused; coordination and communication; patient support and empowerment (partnership, support for self-management, trust and respect) and ready access.538

At the heart of patient-centred care is the on-going relationship between the patient and the doctor. A recent review looked for available instruments to measure the “patient-centeredness” of health care that is delivered.539 They found that there is no one tool to assess this. They identified two instruments measuring patient-centredness, the Patient Perception of Patient-Centeredness (PPCC) and the Consultation Care Measure (CCM) but both these are visit-based and hence episodic in focus. Care will only be truly patient-centred when patients understand about their condition and are able to engage in self-management. Both doctor and patient must comprehend what the other is communicating. Hudson et al rightly identify that for
patients with chronic diseases, what is important is the on-going care over time. One of the key components to determine is how much patients can understand their health issues and actively participate in managing their own health care. This review identifies a gap in our tools to measure this.

In the patent-centred approach, patients and their families take an active role in decision-making about their investigation and management options. However this does not mean that clinicians should never be directive or give advice.

In work colleagues and I have conducted on patients’ preferences for ways to have benefits and risks explained to them, we found that their decisions can be influenced by the way information is presented. For example, for many patients there is a clear preference for explanations framed as relative risk. However this may not be the best way to help patients fully understand risks and benefits even though it may be more persuasive method expression than other modes. For example, a patient may chose an intervention if they are told it will halve their risk of having a heart attack. However if their risk is only 3%, 67 people would need to use the intervention for one heart attack to be prevented in five years. On the other hand, if their risk is 40%, only five people need to use it to prevent one heart attack. These are very different odds and patients need to understand their baseline risk when estimating what benefits they may gain. Clinicians should not manipulate by giving biased information. By only giving patients relative risk information we may coerce them into an action they may chose not to take if informed differently.

Patients may also prefer doctor paternalism rather than autonomy of choice (unless this is framed as patients decide who decides). We found that 60% of patients in our study preferred the GP to give their opinion on management rather than explain the risks. Thirty-seven per cent thought the doctor should make the decision about management, 39% that the patient and doctor should decide together on an equal basis, while 24% considered the patient should decide. The challenge is to support decision-making in a way that is meaningful and acceptable for patients.

Theories about how to change people’s behaviour occur in a number of other disciplines as well as in health care. Economists Thaler and Sunstein argue that people do not always make rational choices that are in their best interest – for example, they may have self-control problems resulting in decisions about eating that lead them to be obese. Human behaviour is shaped by two systems. One is reflective and conscious, goal-orientated and driven by our intentions and our values. The other is automatic, requiring little cognition, driven by feelings and triggered by our environments. Small and apparently insignificant details can have major impacts on people’s behaviour. Presented environmental cues (such as chocolate displayed at
the supermarket check-out) offer immediate certain pleasure which may outweigh the less certain and more distant reward (improved health or a lower body weight). Small and apparently insignificant details, known as nudging, can have major impacts on people’s behaviour. Nudging mainly operates through this automatic system. Shaping environments to cue certain behaviours can be very effective, a fact well recognised by advertisers and retailers. As well as operating in ways detrimental to our health, nudging may be used for improving health outcomes. The choice architecture can be changed so that people are “nudged” to do what is best for them. For example merely presenting fruit and vegetables first and fried foods last in a cafeteria results in healthier eating choices. A more extreme version might be putting dessert in a separate room, which diners have to move to after their main meal if they chose dessert. Nudging can be considered “libertarian paternalism” – it respects people’s choices while aiming to steer them to make the best choices for themselves.

However when does a nudge become a shove? For example how paternalistic should a government be in coercing people to make healthy choices? For some issues governments can use threats, backed up by force – for example, restricting the age of tobacco and alcohol purchase to over 18, banning the sale of unhealthy foods in schools, prohibiting all use of marijuana. There needs to be a balance between paternalism and autonomy. Patients do not always make healthy choices and the costs of these may be borne by society. How much should society incentivise healthy living and how much should they penalise people who make unhealthy choices?

The same question should be asked of medical paternalism – when do we allow people to make decisions that are bad for their health, and when do we make them for them? There may be a role for fear tactics and directive advice-giving. For example, a GP may tell a patient “I have watched several patients like you die in past few years because of their smoking. I don’t want to see the same thing happen to you...” While some patients may object to this approach, others might recognise their physician’s concern, and a conversation may be initiated whereby the patient comes to accept that behaviour change is possible.

With the eCHAT, even if someone says they do not want help, it is still possible for the clinician to intervene. For example, a GP may say to a patient who smokes but does not want help: “I see that you smoke and don’t want help to look at this at the moment. I just want you to know that when you do feel ready to look at your smoking, there are lots of options that can help that I can share with you for you to consider...” This may help shift a patient from pre-contemplative to contemplative. It opens the door to the possibility of behaviour change. One of the tools of general practice is time, and once an issue has been identified, it may be explored further at a later date.
The heart of primary care is the patient-clinician interaction, the two-way sharing of information and communication. Patients are more likely to disclose personal concerns where there is a good therapeutic relationship.\textsuperscript{115} The fact of identifying distress can lead to transformational change and enables the GP to be supportive and affirming and assist patients in practical problem-solving. eCHAT is an aid to initiate and enhance the conversation about choosing to move towards healthier behaviours and more positive mood states (whole-person rather than disease-focused), and then exploring the means by which the patient might achieve these ends.

**10.7 Challenges relating to Information Technology**

**10.7.1 Issues relating to the PMS**

NZ general practice was an early adopter of health IT, with some practices becoming computerised in the 1980s, and remains a consistently high user. The initial use of computers was for administration and payments hence practices invested in PMS. Later the PMS was used for recalls (such as cervical screening and immunisation), other functions such as electronic prescribing and laboratory results followed then clinical records and decision support tools. From being a system for administrative management, the PMS had to adapt to function as an electronic medical record (EMR), a task for which it was not designed. NZ is now burdened by this prior innovation.

In NZ MedTech-32 is the dominant player, with over 80% of the market share.\textsuperscript{454} There are also three small vendors: MyPractice,\textsuperscript{456} Houston\textsuperscript{457} and Profile.\textsuperscript{458} Vendors are funded through licensing fees paid by practices and by payments for data requested by the Ministry of Health. There is some central agency funding of the dominant player for compliance requirements with the others not similarly funded, which creates some issues. Because vendors are funded for compliance there is no driving motivation to improve clinical functionality. With nearly 100% saturation of PMS use in general practice, and large compliance costs for practices if they change vendors, there is little room for market growth, hence little incentive for vendors to compete for quality improvement initiatives. This was the issue that confronted us when attempting to have eCHAT integrated into the PMS.

In recognition of this, in 2010 the National IT Board commissioned a Primary Care PMS Requirements Project to determine and prioritise the requirements for a PMS.\textsuperscript{549} They identified five key objectives:

1. Published standards-based Application Programming Interfaces (APIs). APIs are a particular set of rules and specifications that software programmes can follow to communicate with each other and allow for the sharing of structured information across different systems.
2. **Structured data within the PMS, moving towards semantic interoperability.** To do this defined code-sets that are common across the sector are necessary so that the content when there are information exchange requests what is sent is the same as what is understood.

3. **Support for interoperability standards**, with e-Discharge and e-Referral the priorities (ie between hospitals and general practices)

4. **Information security, access and privacy**

5. **Developing consensus on usability guidelines** including managing “alert fatigue”.

The first initiative, GP2GP, will soon be operational. This will provide general practices with the ability to safely and securely transfer an EMR from one general practice to another. GP2GP allows different PMS systems to ‘talk to’ each other. This will have flow-on benefits in enabling an instrument such as eCHAT to be able to be integrated into all available PMS.

The second project is building a library of common measures. One of the performance indicators for PHOs is recorded smoking status. With semantic interoperability (uniform disease classification and coding to allow meaningful use of data) eCHAT responses will be able to populate the classification, screening and measures fields in any PMS and greatly reduce the need to obtain these data from patients by other mechanisms.

In 2010 the Health Information Standards Organisation (HISO) in 2010 also was established. The purpose of HISO is “to support and promote the development, understanding and use of fit-for-purpose health information standards to improve the NZ health system.” Health information standards will assist with safe and secure exchange of a wide variety of patient information between various healthcare providers. Semantic interoperability can only be accomplished with the universal adoption of appropriate standards.

The goal of the IT Health Board is for all patients to have a “virtual health record, with information stored electronically and accessible regardless of location by linking to: existing systems run by health care organisations (eg, general practice, hospital-based systems), a regional clinical results repository and a shared care record. The Plan proposes shared care planning for specific health events and long-term care that is supported by a single shared care record, which is a structured and comprehensive record, developed by the patient, their family/carer and their health professional(s).”

Also entering the market is the Collaborative Care Management Solution (CCMS). This is a web-based EMR and clinical case management solution that effectively acts as an intermediary and integrates with all existing PMS. For eCHAT this would mean establishing the software within the CCMS and would do away with the need to integrate with each individual PMS.
While eCHAT has been designed as a waiting room application, as a web-based tool it can also be used by patients at home via their PC or other devices. A principle of the North American PCMH is enhanced access to care, and one way to achieve this is to have the EMR not only shared between health providers but also between patient and clinician. Patient portals are being developed both in NZ and internationally which allow seamless access to aspects of their EMR by patients (which may include scheduling appointments, requesting repeat medications, accessing test results and emailing their clinician). Practices could specify criteria by which patients are invited to complete an eCHAT prior to their next scheduled visit to their GP with results integrated into their PMS and initial decision supports such as information sheets or hotline numbers available to patients through the portal pre-consultation. An even more patient-centred approach could be to have eCHAT, and other appropriate tools, available for patients to self-select and hence initiate the patient-clinician interaction about improving their health behaviour and emotional well-being themselves.

The technology is moving fast and the existence of eCHAT as an already developed, evaluated and validated tool for integration into the EMR is attracting great interest from the US and Canada, especially in the text of the PCMH.

10.7.2 Privacy and disclosure issues

Lastly, issues regarding patient privacy and trust regarding the security and use of provided information need to be considered. The fourth factor of the Primary Care PMS Requirements Project outlined above is for common principles and framework for information security, access, privacy and data governance across all settings of care.

Earlier research has found that patients may be reluctant to disclose mental health issues to their GP if they have a lack of trust, not just in their doctor but also in a range of institutions and agencies such as social and secondary services to which their GP might refer them. Patients may fear the consequences of providing such information. Evaluation found a very low objection rate to the CHAT. This issue will largely be overcome where the patient has a good therapeutic relationship with their GP. Furthermore patients may choose to answer no when first exposed to the eCHAT, but it lets them know that these are domains their doctor is interested in and thinks are important for their health and well-being, and this may encourage conversations about some of these issues in the future.

There may also be implications for people with respect to health insurance. Most insurance policies will not cover pre-existing conditions or will charge an extra premium for these. Generally these are medical conditions (for example, ranging from asthma to heart disease) that predate taking out the insurance policy. Health risk factors such as smoking usually are not defined as pre-existing conditions. However the potential remains for denial of insurance
because a patient has disclosed such a behavioural risk to their health (for example, use of marijuana), or the result of an eCHAT has found they meet the diagnostic criteria for depression. This issue is not exclusive to eCHAT. It is one that will need to be addressed as primary care moves more in to identifying health risks, prevention activities and assisting patients with self-management.

The ability to genetically test and screen asymptomatic people to detect and monitor chromosomal differences may have positive health outcomes but has also raised the issue of genetic discrimination - denial of a person’s rights, privileges, or opportunities based on information obtained from genetic testing. There is some evidence of people reporting denial of health insurance cover or even losing their jobs because of their genetic status even when they were asymptomatic for the disorders they were at risk of developing. This concern intensified following the completion of sequencing the human genome in 2003 and in the US resulted in the passing of the Genetic Information Nondiscrimination Act in 2008 to prevent such discrimination.

On-going cognisance will need to be paid towards any moves to discriminate against people because they engage in behaviours that pose risks to their health to ensure that recording such information in their medical records and engaging in interventions to reduce their risk does not have such unwanted discriminatory consequences.

Where high risk is identified, such as disclosure of likely self-harm, or high risk of either inflicting or receiving violence from another person, alerts are triggered and the need to ensure personal safety will override individual privacy issues. Patients should be made aware of this. There are also occasions where patients may disclose illegal behaviours (particularly recreational drug-taking) which have the potential for criminal proceedings. In these cases practitioners need to reassure patients that this information will remain confidential unless there is overwhelming need for legal action to be taken.

All this of course does not only apply to eCHAT. There is an acknowledged need for primary care practitioners to be exploring lifestyle risk factors and mental health issues with their patients for primary and secondary prevention. As mentioned earlier, recording of smoking status is a performance indicator in NZ general practice, and patients must not be penalised for honestly disclosing their smoking and other detrimental behaviours. It is important that policies and practices, from central government down, support processes that assist people to identify lifestyle and emotional factors impacting on their health and well-being and help people to move towards healthier lives.
10.8 Summary of Discussion

In this chapter I have provided an overview of the various stages of development and research leading to the eCHAT, how this has addressed the hypotheses of this thesis and the strengths and limitations of this body of work.

I have discussed other tools available and how the eCHAT differs from these by being a generic approach for all adults looking at both behaviours and mood states that impact on health and well-being, with a whole-person not a disease focus.

There is a section examining different theoretical models on changing behaviour, and explaining how eCHAT can be applied and build on these models. I also discuss the national and international trend towards integrated models of primary care delivery and the role eCHAT could play in these new models of care. These models are premised on the concept of patient-centredness, and this chapter includes discussion on the relationship between this approach and clinical decision-making, and how eCHAT fits within this context.

Finally I address some of the challenges relating to the integration of lifestyle and mood state information into the EMR, both from a technical point of view of incorporating these data into appropriate fields in existing PMS, and also the ethical consideration of possible discrimination people might encounter through disclosing such sensitive information about their lives.
CHAPTER 11. IMPLICATIONS AND CONCLUSION

11.1 Case-finding Needs Integration with Intervention

In this thesis I describe the development, evaluation and validation of the eCHAT, an instrument for detecting and assisting patients to changes to their behaviour and their mood to improve their health. While we have established that eCHAT is feasible, acceptable and valid, it is yet to be definitively demonstrated that use of eCHAT leads to the desired health outcomes.

Kessler rightly emphasises that screening or case-finding tools for issues such as depression will have little or no impact on doctors detecting and managing depression in their patients. As indicated in the meta-analyses discussed in Chapter 3, screening requires organisational systems to ensure that clinicians and practices follow up on the results with appropriate interventions and services.

Kessler identifies considerable barriers to integrating behavioural health into the US primary care health system and the PCMH. In particular family medicine and mental health services have been isolated from each other and delivered separately. This applies to separation in training, focus, treatments, location, data collection and funding. In general, US family physicians do not see promoting behavioural change and assisting with mental health issues as their role, and they often do not have the basic skills required. They may not know what services are available in their community, and what will be effective and good quality. They do not write referrals to allied health professionals in the same way that they do to medical specialists, nor do the allied health professionals provide feedback to them. There are often financial barriers – there is very little available that is government-funded. Most practices do not have a team approach whereby nurses for example might educate and phone monitor patients, and patients may be reluctant to go to see other people with whom they do not have a trusting relationship.

Fortunately NZ is far less burdened in this way. Our general practices have a long heritage of ‘whole-person’ and their family approach. Helping people make positive behaviour changes is core business. A national survey found that 13% of New Zealanders had received physical activity advice and 3% reported receiving a Green Prescription from their GP or practice nurse in the previous year. The Green prescription has been shown to be a very cost-effective intervention. Furthermore, evaluation indicates that Green prescriptions are frequently issued by GPs to relieve anxiety and depression. The NZ smoking cessation guidelines launched in 2007 were followed up by a framework and implementation programme with training provided to GPs and practice nurses in small group settings through their PHOs.
Green prescription and smoking cessation interventions are available at little or no cost to our patients. While some practitioners might have greater competencies than others, general practices also routinely provide care for mental health issues such as depression. The National Depression Initiative, aimed at addressing suicide prevention as well improving the mental health and wellbeing of all New Zealanders, had a high impact in NZ including television advertising featuring ex All Black John Kirwan, promoting the message to the NZ public to see their GP if they are feeling low.565

The MOH also funded a number of PHOs to develop and deliver Primary Mental Health Initiatives (PMHIs) to specifically support primary mental health care. Evaluation of PMHIs found a variety of successful models were implemented, delivering no-cost services to predominantly high-needs populations which were well received by all involved, particularly by patients.567 An optimal model of a PMHI was identified as including an effective IT platform, and incorporating training, health promotion and liaison with both secondary care and with other sectors in the community. Skills needed in primary care include “assessment, use of outcome tools, brief interventions and talking therapies, motivational interviewing, self-management and medication use.” One example of a PMHI, described in Section 9.2.1.1, used the CHAT for initial assessment, up-skilled the primary care workforce, and referred to a plethora of external agencies with good follow-up and communication avenues to and from the practices.433

While eCHAT may have limited value as a stand-alone instrument, used as designed to facilitate patient-clinician interaction about behavioural health and integrated with appropriate interventions and decision support, it has great potential to help New Zealanders be healthier, prevent disease and manage their own health.

11.2 Recommendations

The eCHAT provides an important tool for routine use in primary care settings in lifestyle and mental health domains where strong arguments can be made for case-finding and subsequent intervention. It is a patient-centred, whole person approach which aligns well with national and international trends.

We envisage the eCHAT being used in different ways in different settings. Some practices are already using it with all new patients, and asking adult patients to complete it if it is over two years since their last visit. Because patients complete the eCHAT before their consultation, they indicate whether or not it has brought up any issues which they wish to address in today’s consultation. This means that it is unlikely to inhibit or hinder a patient discussing their own agenda rather than their doctor’s prevention agenda.
We recommend that a version of eCHAT compatible with all PMS should be available to all NZ practices. The copyright for CHAT and eCHAT is held by the Department of General Practice & Primary Health Care, University of Auckland but the tool is open access, with no charge to either patients or practitioners for its use. As a validated tool, it is requested that alterations are not made to the questions. However PHOs and individual practices can customise links to their own decision supports including local services and agencies, as well as determining their own criteria as to when and with which patient groups they will systematically use eCHAT.

11.3 Clinical implications

The patient-centred eCHAT can be administered in the waiting room, pre-booking at home, on a mobile phone or other internet-enabled device. It is cutting-edge technology which helps assess and facilitate patient-directed change. Risky lifestyle behaviours and mental health issues are highly prevalent in primary care settings. Early detection and early action can have significant positive health outcomes and help reduce the later need for curative care services. Change in one eCHAT domain can have cascade effect of changing others. For example, increasing exercise may reduce depression and then allow someone to be ready to stop smoking.

The Help question assists patients to assess their readiness for potential behaviour change and prioritise their attempts to solve identified problems. eCHAT employment facilitates communication between patients and GPs or other primary care providers, allows for rapid assessment of patient needs, and provides summaries which can be used by doctors, nurses and other health providers such as community workers to provide appropriate support to the patient. Its patient-centred whole person approach is likely to lead to greater patient satisfaction with the care they receive.

The eCHAT allows patients to enter their own data which provides considerable time savings for a practice. As well as patients entering or verifying their demographic data, the eCHAT will enter smoking status for all patients who complete it. Smoking status is a performance indicator in the Primary Health Organisation (PHO) Performance Management Programme. Collecting these data using eCHAT will greatly reduce practice compliance costs.

The eCHAT will also record alcohol and other drug use, identify those who are physically inactive and provide PHQ-9 (for depression) and GAD-7 (for anxiety) scores. These can be recorded as repeated measures. A number of PHOs have mental health initiatives that require the recoding of the PHQ-9 and/or GAD-7 and the availability of the ECHAT would hence be of great benefit. Again having patients self-administer these tools saves considerable time.

Once it is integrated into the PMS, eCHAT can easily link with on-line decision support including eTherapies. This can include txt, phone or email monitoring of progress. Because it is quick to
use and well-accepted, the CHAT can be used for follow-up after intervention for identified problems.

### 11.4 Policy implications

eCHAT can help inform policies focused on clinical care, population-based strategies and health promotion.

eCHAT provides a systematic approach to detecting problematic lifestyle behaviours and mental health issues. Its routine use can assist in collection of risk factor data such as people’s current tobacco, alcohol or recreational drug use and assist in population-based primary and secondary prevention programmes. eCHAT data can be used to track progress over time and record the nature and duration of a wide range of interventions employed in addressing the identified issues. In turn this may help inform evidence-based interventions to assist in behaviour change and improve mental health.

Use of eCHAT has the potential to generate large volumes of aggregated data with flow-on uses. For example this could be used to determine the prevalence of substance abuse, depression and anxiety in primary care populations, for on-going monitoring and to inform a needs assessment of community-based resources and services. It may help inform health promotion activities.

### 11.5 Research implications

A future research step is a randomised trial to test against clinical outcomes. This will establish whether systematic use of the CHAT in the primary care setting leads to better health outcomes for patients. Funding is being sought to conduct this in both NZ and the US primary care settings.

Because the eCHAT covers so many life domains it can be utilised in research in a number of different disciplines including substance use and addiction, primary mental health, interpersonal violence and lifestyle changes in the context of chronic conditions. It can be used in both primary care and community settings with adult populations of different ages and ethnicities. eCHAT can be both the subject of research and also the means of selecting specific participants for a variety of different studies. There are also opportunities for various projects in the field of health informatics.

As we move towards the integration of secondary and primary care, and the transfer of patients to and from hospital care (rather than admission and discharge) there will be a single patient
EMR. This will allow automatic linkage to hospital events and eCHAT will enable monitoring of behavioural health progress.

The research possibilities for eCHAT therefore include interventional trials, prevalence, case-control and cohort studies, evaluation of services and identification of patient populations for in-depth qualitative studies.

11.6 Conclusion

This thesis provides an in-depth account of a body of work undertaken over a ten year period in which I developed, evaluated and validated the CHAT, and progressed towards the electronic version, eCHAT. I have explained how this tool is positioned with respect to other instruments and to existing health behaviour change models, and how it can contribute to contemporary patient-centred, whole person, integrated approaches to primary care. Most people would like to live healthy and happy lives, and a key role of primary care providers is to facilitate and support this pursuit.

While this thesis focuses on work conducted between 2001 and 2011, both research and implementation of eCHAT is progressing in primary care and community settings both in NZ and internationally. This is still work-in-progress. The focus of my future research will be to address some of the limitations outlined, to conduct randomised controlled trials to determine the effectiveness of the eCHAT intervention, and to continue to study and implement this innovation.
List of papers incorporated in this thesis

These are reproduced in the supplemental book.


2. Goodyear-Smith F. Recognising and responding to partner abuse: challenging the key facts. NZ Med J. 2004 22;117(1204):U1135.²


List of auxiliary works referred to in this thesis


18. Sidik S M, Arroll B, Goodyear-Smith F. Validation of the GAD-7 (Malay version) among women attending a primary care clinic in Malaysia, J Prim Health Care, under consideration


## APPENDIX A: CASE-FINDING AND HELP ASSESSMENT TOOL (CHAT)

### Life-style Assessment Form

What we do and how we feel can sometimes affect our health. To help us assist you to reach and maintain a healthy and enjoyable lifestyle, please answer the following questions to the best of your ability. Your answers will be kept in strict confidence. Please answer EVERY question. Your GP and / or your practice nurse will be able to see your responses.

Please tick the answer that is nearest to correct for you.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many cigarettes do you smoke on average a day?</td>
<td>None ☐, Less than 1 a day ☐, 1-10 ☐, 11-20 ☐, 21-30 ☐, 31 or more ☐</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down or stop your smoking? (Tick no if you do not smoke)</td>
<td>No ☐, Yes → If yes, do you want help with this? ☐, Yes ☐, No ☐, Yes but not today ☐</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down on your drinking alcohol? (Tick no if you do not drink alcohol OR do not feel the need to cut down)</td>
<td>No ☐, Yes ☐</td>
</tr>
<tr>
<td>In the last year, have you ever drunk more alcohol than you meant to?</td>
<td>No ☐, Yes → If yes, do you want help with this? ☐, Yes ☐, No ☐, Yes but not today ☐</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down on your non-prescription or recreational drug use? (Tick no if you do not use other drugs OR do not feel the need to cut down)</td>
<td>No ☐, Yes ☐</td>
</tr>
<tr>
<td>In the last year, have you ever used non-prescription or recreational drugs more than you meant to?</td>
<td>No ☐, Yes → If yes, do you want help with this? ☐, Yes ☐, No ☐, Yes but not today ☐</td>
</tr>
<tr>
<td>Do you sometimes feel unhappy or worried after a session of gambling?</td>
<td>No ☐, Yes ☐</td>
</tr>
<tr>
<td>Does gambling sometimes cause you problems?</td>
<td>No ☐, Yes → If yes, do you want help with this? ☐, Yes ☐, No ☐, Yes but not today ☐</td>
</tr>
</tbody>
</table>
During the past month have you often been bothered by feeling down, depressed or hopeless?
[ ] No  [ ] Yes

During the past month have you often been bothered by having little interest or pleasure in doing things?
[ ] No  [ ] Yes → If yes to either or both of these 2 questions, do you want help with this?
[ ] No  [ ] Yes but not today  [ ] Yes

During the past month have you been worrying a lot about everyday problems?
[ ] No  [ ] Yes → If yes, do you want help with this?
[ ] No  [ ] Yes but not today  [ ] Yes

What aspects of your life are causing you significant stress at the moment?
[ ] None  [ ] Relationship  [ ] Work  [ ] Home life  [ ] Money  [ ] Health
[ ] Study  [ ] Other (specify) ________________________________

Is there anyone in your life of whom you are afraid or who hurts you in any way?
[ ] No  [ ] Yes

Is there anyone in your life who controls you and prevents you doing what you want?
[ ] No  [ ] Yes → If yes, do you want help with this?
[ ] No  [ ] Yes but not today  [ ] Yes

Is controlling your anger sometimes a problem for you?
[ ] No  [ ] Yes → If yes, do you want help with this?
[ ] No  [ ] Yes but not today  [ ] Yes

As a rule, do you do at least 30 minutes of moderate or vigorous exercise (such as walking or a sport) on 5 or more days of the week?
[ ] Yes  [ ] No → If No, do you want help with this?
[ ] No  [ ] Yes but not today  [ ] Yes

Do you often feel that you can’t control what or how much you eat?
[ ] No  [ ] Yes

Does your weight affect the way you feel about yourself?
[ ] No  [ ] Yes → If yes, do you want help with this?
[ ] No  [ ] Yes but not today  [ ] Yes

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APPENDIX B: COMPOSITE REFERENCE STANDARD

LIFESTYLE AND MOOD QUESTIONNAIRE

Thank you for agreeing to participate in this study. Your answers will be kept in strict confidence.

Please answer all questions by ticking in the boxes.

If you have difficulty with a statement, then choose the response that is mostly right for you. There are no right or wrong answers.

Gender  □ M  □ F

Age __________ years  Your occupation ____________________

Which ethnic group do you belong to? (Tick the box or boxes which apply to you)

□ NZ European  □ Māori  □ Cook Island Māori  □ Samoan
□ Tongan  □ Niuean  □ Chinese  □ Indian
□ Other (such as Dutch, Japanese, Tokelauan) Please state ________________________________________________

SMOKING QUESTIONS

Do you currently ever smoke cigarettes or other tobacco products? □ No  □ Yes

IF NO, GO TO QUESTIONS ON ALCOHOL USE

How soon after waking do you smoke your first cigarette?

□ <5 minutes  □ 5 - 30 minutes  □ 31 - 60 minutes  □ > 60 minutes

How many cigarettes do you smoke on average per day?

□ 0 – 10  □ 11 - 20  □ 21 - 30  □ > 30
**ALCOHOL USE QUESTIONS**

If you never drink, please tick all the “Never” boxes.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Mthly or less</th>
<th>2-4 times a mth</th>
<th>2-3 times a week</th>
<th>4 or &gt; times week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often do you have a standard drink containing alcohol? (See Picture at Bottom for Standard Drink Size)</td>
<td>1 or 2</td>
<td>3 or 4</td>
<td>5 or 6</td>
<td>7 to 9</td>
<td>10 or more</td>
</tr>
<tr>
<td>2. How many standard drinks do you have on a typical day when you are drinking?</td>
<td>Never</td>
<td>&lt; mthly</td>
<td>Mthly</td>
<td>Weekly</td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>3. How often do you have 6 or more standard drinks on one occasion?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. How often during the last year have you found that you were not able to stop drinking once you had started?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. How often during the last year have you failed to do what was normally expected from you because of your drinking?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. How often during the last year have you needed an alcoholic drink in the morning to get yourself going after a heavy drinking session?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. How often during the last year have you had a feeling of guilt or regret after drinking?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. How often during the last year have you been unable to remember what happened the night before because you had been drinking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Have you or someone else been injured as a result of your drinking?</td>
<td>No</td>
<td>Yes, but not in the last year</td>
<td>Yes, during the last year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Has a friend, doctor or other health worker been concerned about your drinking or suggested you cut down?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FOR YOUR REFERENCE:** One standard drink is:

- 200 ml of normal beer
- 1 glass of wine
- 1 single nip of spirits
- 1/4 jug of beer
- 2/3 can of beer
**OTHER DRUG USE QUESTIONS**

The following questions ask about drug use *not including alcohol or tobacco* during the past 12 months.  
In the statements "drug abuse" refers to  
(1) the use of prescribed or over the counter drugs in excess of the directions and  
(2) any non-medical ("recreational") use of drugs.

The various types of non-medical ("recreational") drugs may include:  
Cannabis (eg marijuana, hash), solvents (eg glue), tranquillisers (eg Valium) barbiturates,  
cocaine, stimulants (eg speed, 'P'), ecstasy, hallucinogens (eg LSD) or narcotics (eg  
Heroin, Homebake).

| 1 Have you used drugs other than those required for medical reasons in the past 12 months? | No | Yes |
| 2 Have you abused prescription drugs in the past 12 months? |     |     |

**IF NO TO 1 AND 2, GO TO GAMBLING QUESTIONS**

| 3 Do you abuse more than one drug at a time? |     |
| 4 Can you always get through the week without using drugs? |     |
| 5 Are you always able to stop using drugs when you want to? |     |
| 6 Have you had "blackouts" or "flashbacks" as a result of drug use? |     |
| 7 Do you ever feel bad or guilty about your drug use? |     |
| 8 Does your spouse (or parents) ever complain about your involvement with drugs? |     |
| 9 Has drug abuse created problems between you and your spouse or your parents? |     |
| 10 Have you lost friends because of your use of drugs? |     |
| 11 Have you neglected your family because of your use of drugs? |     |
| 12 Have you been in trouble at work because of drug abuse? |     |
| 13 Have you lost a job because of drug abuse? |     |
| 14 Have you got into fights when under the influence on drugs? |     |
| 16 Have you engaged in illegal activities in order to obtain drugs? |     |
| 17 Have you been arrested for possession of illegal drugs? |     |
| 18 Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs? |     |
| 19 Have you had medical problems as a result of your drug use (eg, memory loss, hepatitis, convulsion, bleeding, etc?) |     |
| 20 Have you gone to anyone for help for a drug problem? |     |
| 21 Have you been involved in a treatment programme specifically related to drug use? |     |
If yes, to any of the above, what recreational drugs do you use?

<table>
<thead>
<tr>
<th>Drug Type</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabis (eg marijuana, hashish, hash oil)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opiates (eg morphine, MST, heroin, ‘home bake’, methadone, codeine)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amphetamines (eg ‘speed’, methamphetamine, ‘P’, fantasy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecstasy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzodiazepines (‘Benzos’ eg Valium, Halcion, Rivotril)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tranquilisers (eg Serepax)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hallucinogens (eg (LSD - ‘acid’, lysergic acid, mushrooms, cactus, datura)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glue &amp; other solvents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocaine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How often do you use other drugs?

- [ ] Once per week or less
- [ ] More than once a week
- [ ] Once a day
- [ ] 2-3 times daily
- [ ] 4 or more times daily

**GAMBLING QUESTIONS**

Most people in New Zealand enjoy gaming or betting - the choice available is wide, whether it is horse or dog racing, playing Lotto, Daily Keno or Instant Kiwi; gambling machines; casinos; sports betting; card or dice games; bets with friends for money or internet gambling. To measure your own experience of gambling, please help by answering the following questions.

Do you play any of the following?

<table>
<thead>
<tr>
<th>Mode of gambling</th>
<th>Never</th>
<th>Less than once a week</th>
<th>Once a week or more</th>
<th>Several times a day if able</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lotto</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instant Keno</td>
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<tr>
<td>Daily Keno</td>
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<td></td>
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<tr>
<td>Other scratch tickets</td>
<td></td>
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<td></td>
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<tr>
<td>Housie for money</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Betting on horses &amp; dogs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gambling machines (pokies) outside casinos</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casino - tables (eg cards, dice, roulette)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Casino - pokies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Card games for money</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode of gambling</td>
<td>Never</td>
<td>Less than once a week</td>
<td>Once a week or more</td>
<td>Several times a day if able</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
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<td>------------------------</td>
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</tr>
<tr>
<td>Dice games for money</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bets with friends for money</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sports betting</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Video games</td>
<td></td>
<td></td>
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<tr>
<td>Pool or snooker for money</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>0900 phone games</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet gambling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speculation with shares or property</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any other gambling? (write kind [ ])</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Sometimes</th>
<th>Most of the time/ Every time</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you've gambled, how often do you go back another day to win back the money you lost?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you ever said you were winning from gambling when really you had lost?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you feel you have ever had a problem with betting money or gambling?</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Did you ever spend either more time or more money gambling than you intended?  
Have people ever criticised your gambling or told you that you had a gambling problem, regardless of whether or not you thought it was true?  
Have you ever felt guilty about the way you gamble, or what happens to you when you gamble?  
Have you ever felt you would like to stop gambling, but didn’t think you could?  
Have you ever hidden gambling evidence or gambling money from your partner, children, or other important people in your life?  
If you argued, have the money arguments ever been centred on your gambling?  
Have you ever borrowed from someone and not paid them back as a result of your gambling?  
Have you ever lost time from work, school, or study as a result of your gambling?
If you ever borrowed money to gamble or to pay gambling debts, was it from:

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Borrowed from household money</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Borrowed from spouse or partner</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>Borrowed from other relations or in-laws</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>Loans from banks, loan companies, or credit unions</td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>Cash withdrawals from credit cards</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>Loans from loan sharks</td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>Cashed in shares, bonds, or other securities</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>Sold your own, or family property</td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>Wrote cheques that would bounce</td>
<td></td>
</tr>
</tbody>
</table>

**MOOD QUESTIONS**

Over the last 2 weeks, how often have you been bothered by any of the following problems?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Little interest or pleasure in doing things</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Feeling down, depressed, or hopeless</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>Trouble falling or staying asleep, or sleeping too much</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>Feeling tired or having little energy</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>Poor appetite or overeating</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td>Feeling bad about yourself - or that you are a failure or have let yourself or your family down</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>Trouble concentrating on things, such as reading the newspaper or watching television</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Thoughts that you would be better off dead or of hurting yourself in some way</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tick the box closest to how you have been feeling in the past week. Don't take too long - your immediate response is best.

**I feel tense or 'wound up':**
- Most of the time ➡️
- A lot of the time ➡️
- From time to time, occasionally ➡️
- Not at all ➡️

**I feel as if I am slowed down:**
- Nearly all the time ➡️
- Very often ➡️
- Sometimes ➡️
- Not at all ➡️

**I still enjoy the things I used to enjoy:**
- Definitely as much ➡️
- Not quite so much ➡️
- Only a little ➡️
- Hardly at all ➡️

**I get a sort of frightened feeling like 'butterflies' in the stomach:**
- Not at all ➡️
- Occasionally ➡️
- Quite Often ➡️
- Very Often ➡️
I get a sort of frightened feeling as if something awful is about to happen:
Very definitely and quite badly
Yes, but not too badly
A little, but it doesn’t worry me
Not at all

I can laugh and see the funny side of things:
As much as I always could
Not quite so much now
Definitely not so much now
Not at all

Worrying thoughts go through my mind:
A great deal of the time
A lot of the time
From time to time, but not too often
Only occasionally

I feel cheerful:
Not at all
Not often
Sometimes
Most of the time

I can sit at ease and feel relaxed:
Definitely
Usually
Not often
Not at all

I have lost interest in my appearance:
Definitely
I don’t take as much care as I should
I may not take quite as much care
I take just as much care as ever

I feel restless as I have to be on the move:
Very much indeed
Quite a lot
Not very much
Not at all

I look forward with enjoyment to things:
As much as I ever did
Rather less than I used to
Definitely less than I used to
Hardly at all

I get sudden feelings of panic:
Very often indeed
Quite often
Not very often
Not at all

I can enjoy a good book or radio or TV programme:
Often
Sometimes
Not often
Very seldom

HURT AND ANGER QUESTIONS
No matter how well people get along, there may be times when they disagree, get annoyed with another person, want different things from each other, or just have spats or fights because they are in a bad mood, are tired, or for some other reason. People have many different ways of trying to settle their differences.

Please state how many people there are in your life with whom you have significant conflict:

☐ 0   ☐ 1   ☐ 2   ☐ 3   ☐ 4 or greater

For the purpose of this questionnaire, please choose the most significant person in your life with whom conflict in your relationship is, or could be, problematic.
If there is no-one in your life with whom you have significant conflict, please chose the person in your life with whom conflict would be most concerning to you.

This other person is my:
☐ Partner  ☐ Parent  ☐ Child  ☐ Employer  ☐ Other (specify) ________________________________
How often does this other person:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Fairly often</th>
<th>Frequently</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physically hurt you?</td>
<td>☐</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Insult you or talk down to you?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Threaten you with harm?</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>4</td>
<td>Scream or curse at you?</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Here is a list of things that might have happened when you have had a conflict or disagreement with this other person. Please tick how many times you each did these things in the past year, and how many times the other person did them in the past year:

<table>
<thead>
<tr>
<th></th>
<th>Hit</th>
<th>1yr</th>
<th>2yr</th>
<th>3+yr</th>
<th>10yr</th>
<th>11-20yr</th>
<th>&gt;20yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>I sulked and/or refused to talk about the conflict.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>E2</td>
<td>The other person sulked and/or refused to talk about the conflict.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>F1</td>
<td>I stamped out of the room or house</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>The other person stamped out of the room or house</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>I cried</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>The other person cried</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1</td>
<td>I said something to spite the other person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2</td>
<td>The other person said something to spite me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>J1</td>
<td>I threatened to hit or throw something at the other person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J2</td>
<td>The other person threatened to hit or throw something at me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J3</td>
<td>I threw or smashed or hit or kicked something</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J4</td>
<td>The other person threw or smashed or hit or kicked something</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K1</td>
<td>I threw something at the other person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K2</td>
<td>The other person threw something at me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td>I pushed, grabbed or shoved the other person</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>The other person pushed, grabbed or shoved me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>I slapped the other person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>The other person slapped me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N1</td>
<td>I kicked, bit or hit the other person with a fist</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N2</td>
<td>The other person kicked, bit or hit me with a fist</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O1</td>
<td>I hit or tried to hit the other person with something</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O2</td>
<td>The other person hit or tried to hit me with something</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P1</td>
<td>I beat up the other person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>The other person beat me up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q1</td>
<td>I threatened the other person with a knife or gun</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>The other person threatened me with a knife or gun</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1</td>
<td>I used a knife or gun on the other person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td>The other person used a knife or gun on me</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
PHYSICAL ACTIVITY QUESTIONS

1. For the last 3 months, which of the following moderate or vigorous activities have you performed regularly?

   Where you tick 'Yes' please estimate the amount of your activity.

Walking  No□ Yes□  How many sessions a week?

What is your usual pace of walking? (tick one only)
Casual or strolling □ Average or normal □ Fairly briskly □ Brisk or striding □
(<3 kph) (3-5 kph) (5-6.5 kph) (≥ 6.5 kph)

Stair climbing No□ Yes□  How many flights do you climb UP each day?
(1 flight = 10 steps)

Jogging or running No□ Yes□  How many sessions a week?

Treadmill No□ Yes□  How many sessions a week?

Bicycling No□ Yes□  How many sessions a week?

Jogging or running No□ Yes□  How many sessions a week?

Swimming laps No□ Yes□  How many sessions a week?

Aerobic dance/Calisthenics/Floor exercise No□ Yes□  How many sessions a week?

Moderate sports  No□ Yes□  How many sessions a week?
(eg leisure volleyball, golf (not riding), social dancing, doubles tennis)

Vigorous racquet sports  No□ Yes□  How many sessions a week?
(eg raquet ball, singles tennis)

Other vigorous sports or exercise involving running No□ Yes□
(eg basketball, soccer, rugby) Specify __________________________
How many sessions a week?
Average number of mins per session?

Other activities  No ☐ Yes ☐ Specify __________________________

How many sessions a week?
Average number of mins per session?

Weight training  No ☐ Yes ☐
(Machines, free weights)  How many sessions a week?
Average number of mins per session?

Household activities  No ☐ Yes ☐
(sweeping, vacuuming, washing clothes, scrubbing floors)  How many sessions a week?
Average number of mins per session?

Lawn mowing & gardening  No ☐ Yes ☐  How many hours a week?

2 How many times a week do you engage in vigorous physical activity long enough to work up a sweat?

EATING QUESTIONS

<table>
<thead>
<tr>
<th>Question</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you make yourself sick because you feel uncomfortably full?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you worry you have lost control over how much you eat?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you recently lost more than 7.7 kg (one stone; 14 lb) in a 3 month period?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you believe yourself to be fat when others say you are thin?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would you say that food dominates your life?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you satisfied with your eating patterns?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you ever eat in secret?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does your weight affect the way you feel about yourself?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you currently suffer with or have you ever suffered in the past with an eating disorder?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Many thanks for completing this interview.

You are assured that your answers will remain confidential and you will not be identified to the researchers receiving this survey.

However, should your answers have indicated that your safety is at risk, from either yourself or another person, then we would like you to see your GP again right away so that you can get help. The research assistant will discuss this with you before contacting your GP.
Are you currently taking any of these drugs? If yes, please tick.
Please indicate whether you are already on this medication or whether your GP is starting you on it today.

This side in alphabetical order by chemical name (same drugs on both sides).

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Trade Name</th>
<th>YES Already taking</th>
<th>YES Start today</th>
<th>Chemical Name</th>
<th>YES Already taking</th>
<th>YES Start today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alprazolam</td>
<td>Xanax</td>
<td></td>
<td></td>
<td>Loxapine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aminophylline</td>
<td>Amidtrip</td>
<td></td>
<td></td>
<td>Maprotiline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Ascendin</td>
<td></td>
<td></td>
<td>Methotrizoprazine</td>
<td></td>
<td></td>
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<tr>
<td>Busprone</td>
<td>Bron</td>
<td></td>
<td></td>
<td>Mianserin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Busprone</td>
<td>Buspar</td>
<td></td>
<td></td>
<td>Moclobemide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorpromazine</td>
<td>Largactil</td>
<td></td>
<td></td>
<td>Nefazodone</td>
<td></td>
<td></td>
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<tr>
<td>Citation</td>
<td>Cipramil</td>
<td></td>
<td></td>
<td>Nortriptyline</td>
<td></td>
<td></td>
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<tr>
<td>Comimpramine</td>
<td>Anafranil</td>
<td></td>
<td></td>
<td>Olanzapine</td>
<td></td>
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<tr>
<td>Compramine</td>
<td>Clopress</td>
<td></td>
<td></td>
<td>Oxazepam</td>
<td></td>
<td></td>
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<tr>
<td>Cozaeprine</td>
<td>Clopril</td>
<td></td>
<td></td>
<td>Paroxetine</td>
<td></td>
<td></td>
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<tr>
<td>Cipoline</td>
<td>Clopine</td>
<td></td>
<td></td>
<td>Pericycline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desipramine</td>
<td>Pertrofan</td>
<td></td>
<td></td>
<td>Phencyclidine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diazepam</td>
<td>Pro-pan</td>
<td></td>
<td></td>
<td>Pipidoxine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dothiepin</td>
<td>Prothiaden</td>
<td></td>
<td></td>
<td>Pimozide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dothiepin</td>
<td>Dopress</td>
<td></td>
<td></td>
<td>Prochlorperazine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>Anten</td>
<td></td>
<td></td>
<td>Quetiapine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Droperidol</td>
<td>Droplancian</td>
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<td></td>
<td></td>
<td>Zuclopenthiol</td>
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</tbody>
</table>
Are you currently taking any of these drugs? If yes, please tick.

Please indicate whether you are already on this medication or whether your GP is starting you on it today.

This side in alphabetical order by Trade name (same drugs on both sides)

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Chemical Name</th>
<th>YES Already taking</th>
<th>Trade Name</th>
<th>Chemical Name</th>
<th>YES Starting today</th>
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<tr>
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<td>Phencalcine</td>
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<td>Zypressa</td>
<td>Olanzapine</td>
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</table>
APPENDIX D: GP ASSESSMENT & INTERVENTION RECORD (GAIR) USED IN TQWHQ VALIDATION STUDY

GP Assessment & Intervention Record (GAIR)

<table>
<thead>
<tr>
<th>Do you think this patient has a problem with (please tick):</th>
<th>NO</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesser depression</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If YES, intervention(s) offered: TICK AS MANY AS APPLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Any safety issues?</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>If Yes are they dealt with?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If you provided an intervention, please specify in the box below (e.g. name & dose of drug; psychological intervention such as CBT, problem-solving)
APPENDIX E: CURRENT PAPER VERSION OF THE CHAT

Life-style Assessment Form

What we do and how we feel can sometimes affect our health. To help us assist you to reach and maintain a healthy and enjoyable lifestyle, please answer the following questions to the best of your ability.

PLEASE TICK THE ANSWER THAT IS NEAREST TO CORRECT FOR YOU

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many cigarettes do you smoke on average a day?</td>
<td>□ None □ Less than 1 a day □ 1-10 □ 11-20 □ 21-30 □ 31 or more</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down or stop your smoking? (Tick no if you do not smoke)</td>
<td>□ No □ Yes → → If yes to either or both of these 2 questions, do you want help with this?</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down on your drinking alcohol?</td>
<td>□ No □ Yes → → If yes to either or both of these 2 questions, do you want help with this?</td>
</tr>
<tr>
<td>In the last year, have you ever drunk more alcohol than you meant to?</td>
<td>□ No □ Yes → → If yes to either or both of these 2 questions, do you want help with this?</td>
</tr>
<tr>
<td>Do you ever feel the need to cut down on your non-prescription or recreational drug use? (Tick no if you do not use other drugs or do not feel the need to cut down)</td>
<td>□ No □ Yes → → If yes to either or both of these 2 questions, do you want help with this?</td>
</tr>
<tr>
<td>In the last year, have you ever used non-prescription or recreational drugs more than you meant to?</td>
<td>□ No □ Yes → → If yes to either or both of these 2 questions, do you want help with this?</td>
</tr>
<tr>
<td>Do you sometimes feel unhappy or worried after a session of gambling?</td>
<td>□ No □ Yes → → If yes to either or both of these 2 questions, do you want help with this?</td>
</tr>
<tr>
<td>Does gambling sometimes cause you problems?</td>
<td>□ No □ Yes → → If yes to either or both of these 2 questions, do you want help with this?</td>
</tr>
<tr>
<td>Question</td>
<td>Yes</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>During the past month have you often been bothered by feeling down, depressed or hopeless?</td>
<td>No</td>
</tr>
<tr>
<td>During the past month have you often been bothered by having little interest or pleasure in doing things?</td>
<td>No</td>
</tr>
<tr>
<td>If Yes to either or both of these 2 questions, do you want help with this?</td>
<td>No</td>
</tr>
<tr>
<td>During the past month have you been worrying a lot about everyday problems?</td>
<td>No</td>
</tr>
<tr>
<td>If Yes, do you want help with this?</td>
<td>No</td>
</tr>
<tr>
<td>Is there anyone in your life of whom you are afraid or who hurts you in any way?</td>
<td>No</td>
</tr>
<tr>
<td>Is there anyone in your life who controls you and prevents you doing what you want?</td>
<td>No</td>
</tr>
<tr>
<td>If Yes to either or both of these 2 questions, do you want help with this?</td>
<td>No</td>
</tr>
<tr>
<td>Is controlling your anger sometimes a problem for you?</td>
<td>No</td>
</tr>
<tr>
<td>If Yes, do you want help with this?</td>
<td>No</td>
</tr>
<tr>
<td>As a rule, do you do more than 30 minutes of moderate or vigorous exercise (such as walking or a sport) on 5 days of the week?</td>
<td>Yes</td>
</tr>
</tbody>
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