

NZHTA REPORT
January 2002
Volume 5 Number 1

Youth-specific primary health care – access, utilisation and health outcomes

A critical appraisal of the literature

Kaaren Mathias

**New Zealand
Health Technology Assessment**

Department of Public Health and General Practice
Christchurch School of Medicine
Christchurch, NZ.

Division of Health Sciences, University of Otago

NEW ZEALAND HEALTH TECHNOLOGY ASSESSMENT (NZHTA)
THE CLEARING HOUSE FOR HEALTH OUTCOMES AND
HEALTH TECHNOLOGY ASSESSMENT

Department of Public Health and General Practice
Christchurch School of Medicine and Health Sciences
Christchurch, New Zealand

Youth-specific primary health care – access, utilisation and health outcomes

A critical appraisal of the literature

Kaaren Mathias

This report should be referenced as follows:

Mathias K. Youth-specific primary health care – access, utilisation and health outcomes.
NZHTA Report 2002; 5(1)

2002 New Zealand Health Technology Assessment (NZHTA)

ISBN 1-877235-20-2

ISSN 1174-5142

ACKNOWLEDGEMENTS

This report was developed by the staff of NZHTA. It was prepared by Dr Kaaren Mathias (Researcher), supported by Dr Ray Kirk (Director), Mrs Susan Bidwell (Information Specialist), Dr Robert Weir (Researcher), Ms Marita Broadstock (Researcher), Ms Cecilia Tolan (Administrator) and Mrs Ally Reid (Secretary/Word Processor). Miss Becky Mogridge, Miss Tracey Smitheram and Mrs Joan Downey provided additional administrative assistance.

Editorial assistance was provided by Mrs Carolyn Davies.

The review was externally peer-reviewed by Dr Simon Denny (Paediatrician).

The Canterbury Medical Library provided invaluable assistance with the retrieval of articles used in this review.

NZHTA is a research unit of the University of Otago, funded under contract to the Ministry of Health.

The Ministry of Health commissioned this report.

DISCLAIMER

NZHTA takes great care to ensure the accuracy of the information supplied within the project timeframe, but neither NZHTA nor the University of Otago can accept responsibility for any errors or omissions. The reader should always consult the original database from which each abstract is derived along with the original articles before making decisions based on a document or abstract. All responsibility for action based on any information in this report rests with the reader. NZHTA and the University of Otago accept no liability for any loss of whatever kind, or damage, arising from the reliance in whole or part, by any person, corporate or natural, on the contents of this report. This document is not intended to be used as personal health advice. People seeking individual medical advice are referred to their physician. The views expressed in this report are those of NZHTA and do not necessarily represent those of the University of Otago or the New Zealand Ministry of Health.

COPYRIGHT

This work is copyright. Apart from any use as permitted under the *Copyright Act 1994* no part may be reproduced by any process without written permission from New Zealand Health Technology Assessment. Requests and inquiries concerning reproduction and rights should be directed to the Director, New Zealand Health Technology Assessment, Christchurch School of Medicine and Health Sciences, P O Box 4345, Christchurch, New Zealand.

CONTACT DETAILS

New Zealand Health Technology Assessment
The Clearing House for Health Outcomes and Health Technology Assessment
Department of Public Health and General Practice
Christchurch School of Medicine and Health Sciences
P O Box 4345
Christchurch
New Zealand
Tel: +64 3 364 1152 Fax: +64 3 364 1152

E-mail: nzhta@chmeds.ac.nz

Website: <http://nzhta.chmeds.ac.nz/>

EXECUTIVE SUMMARY

Objectives

This study was commissioned by the New Zealand Ministry of Health to provide an evidence-based review of the effectiveness of youth-specific primary health care. The primary objective was to assess the impacts of youth-specific primary care on access, utilisation, mental health, health outcomes and emergency department use.

Secondary objectives were to describe factors that increase access and utilisation and improve health status in delivery of primary care services to youth and to encourage outcome evaluations of youth health interventions

Data sources

The systematic literature review used a number of health and educational databases including Medline, Embase, Cinahl, Eric, Social Science Citation Index, Index New Zealand, Cochrane Database of Systematic Reviews and Database of Abstracts of Reviews of Effectiveness. Various other electronic and bibliographic sources included reference lists of papers retrieved during the course of the search, and New Zealand subject experts in the field. Other “grey” literature was sought through personal contact with staff at the Ministry of Health. Searches had no language limits and were for studies published between 1990 and September 2001. These searches generated 443 citations.

Study selection

Studies were selected and appraised if they quantitatively evaluated youth-specific primary health care with participants aged 10 to 24 years with some measure of health outcome for the group to whom the intervention was offered.

Eligible study designs included meta-analyses, systematic reviews, randomised controlled trials, cohort studies, case-control studies, before-and-after studies and cross-sectional studies.

Criteria for exclusion from appraisal included:

- studies with samples of less than 20 participants
- evaluating “issue specific” topics relevant to youth and adolescent health
- evaluating an intervention which was not part of a youth-specific primary health programme
- “correspondence”, conference proceedings, abstracts
- a chapter reviewing New Zealand studies uses broader inclusion criteria
- a single reviewer (the author) applied these criteria considering abstracts from the original search, 80 articles were identified as possibly suitable for inclusion and were retrieved as full text. Of these, 23 studies were included in this review.

Data extraction and synthesis

Articles were formally appraised by the author using the schedule developed by the Group Health Cooperative of Puget Sound (Group Health Cooperative of Puget Sound 1996), and adapted by the New Zealand Guidelines Group of the National Health Committee (New Zealand Guidelines Group 1997). A single reviewer (the author) applied these criteria. Levels of evidence were also applied (U.S. Preventive Services Task Force 1989).

Relevant qualitative New Zealand studies considered were appraised using two checklists for appraisal of qualitative research, and were not assigned an evidence grading.

Key results and conclusions

This review appraised 23 studies that met the criteria for inclusion. Results are presented separately according to the different outcomes assessed.

Access and utilisation

Seventeen studies considered the impact youth-targeted primary care has on access and utilisation. Two were retrospective cohort studies and the remainder cross-sectional studies. All 17 studies reported high levels of utilisation of youth-specific primary care services.

Seven studies reported on relative health service utilisation by youth users of school-based health clinics (SBHC) versus comparator groups without access to a SBHC. All seven studies described significantly greater utilisation (mean annual visits) of health services by students with access to youth-targeted care. Some of these studies show that young people who particularly benefit from enhanced access, are those who are socio-economically disadvantaged, female and at-risk. Whilst some studies demonstrate increased access for ethnic minorities, the evidence is not consistent. Evidence suggests increased access for rural youth compared to urban youth in using SBHCs.

Overall research evidence clearly supports enhanced access to primary health care through youth-specific services.

Mental health

Eight studies considered access and utilisation of mental health services within primary care, and two studies evaluated the effect on self-reported mental health status.

Four studies evaluating accessing of mental health services at a SBHC, described greater utilisation of youth-targeted services. Of two robust retrospective cohort studies, Kaplan et al. (1998) showed mental health visits were 10 times higher in students with SBHC access, and Juszczak (1999) demonstrated that males with SBHC access were 45 times more likely to access mental health service than those only with traditional primary care. Mental health consultations made up one-fifth to one-quarter of all consultations at a SBHC (Anglin et al. 1996; Jepson et al. 1998).

Two studies found no statistical difference in use of the SBHC related to self-reported mental health variables (Kisker and Brown 1996; Pastore et al. 1998).

Evidence supports enhanced utilisation of mental health services within a youth-specific primary care service, but shows no evidence of improved self-reported mental health status among clinic users.

Emergency department use

Five studies evaluated the impact of youth-specific primary care on emergency department use. Three of the methodologically more robust studies described significant reductions in emergency department use by students with access to youth-specific primary care. Juszczak (1999) found youth who had never had SBHC access were six times more likely to use the emergency department than youth with SBHC access. Kaplan et al. (1998) found students with SBHC access used the emergency department a half to a third as often than those without SBHC access. This is confirmed by Santelli for students who had SBHC access for greater than one year (Santelli et al. 1996a). The two studies which showed no difference in emergency department use between students with, and without, SBHC access are less robust. On balance, the research evidence suggests youth-targeted primary care reduced emergency department usage. Further methodologically sound research is required to confirm this.

Health outcomes

Only four studies assessed health outcomes among young people using youth-specific primary care. All four studies assessed outcomes related to reproductive health (sexual activity, contraceptive use, pregnancy rates), and all were methodologically poor to moderate in quality. One study described a small, but statistically significant increase in reported condom and contraceptive pill use after SBHCs started in two of six schools. Overall, there is currently insufficient evidence to support improved health outcomes among young people using youth-targeted primary care.

New Zealand studies

Eight New Zealand studies were discussed and appraised. Two of these fitted the inclusion criteria and contributed to the access and utilisation section of the systematic review. A further six New Zealand studies relating to youth and primary care were included with more broad criteria and appraised to provide local perspectives.

Access barriers were defined by youth in six studies. These included:

- cost of doctor's visit/prescriptions
- concerns of confidentiality
- embarrassment
- distance to travel
- inconvenient times
- lack of cultural appropriateness.

These intersect markedly with access issues described by US youth, and give confidence in the applicability of other aspects of the US research to NZ.

Three studies noted the importance of cultural appropriateness of health care providers to Maori and Pacific youth. This is not explicitly described in any of the US literature. New Zealand studies also reported a strong preference by the vast majority of youth respondents (over 80% in all three studies where their opinion was sought) for youth-specific services. New Zealand and US studies identify similar access barriers to primary care for young people, and a clear preference for youth-specific primary care.

Summary

Evidence strongly supports enhanced access and utilisation of primary care and mental health services within primary care, by young people through youth-specific services. It suggests youth-specific primary care can reduce emergency department use. Currently, there is insufficient evidence to demonstrate changes in physical or mental health status through youth-specific primary health care.

There is, therefore, an urgent need for further New Zealand based and international research to determine the effectiveness of youth-specific primary health services. It should address limitations in study design and types of evaluation discussed in this review. These should include appropriate matched comparator groups.

Importantly, studies are needed that evaluate health outcomes of attendance at youth-specific primary health services. If funds are invested into programmes, it is essential to know what effect these have on health status

MeSH headings

School health services, comprehensive health care, program evaluation, outcome assessment (health care), randomized controlled trials, cohort studies, meta-analysis, controlled clinical trials, longitudinal studies, evaluation studies, follow-up, prospective studies.

Additional key words (school* or tertiary or university or college or teen* or adolescent* or youth or juvenile) AND (center* or centre* or clinic or clinics or service*), effective*, outcome*, evaluate*, one stop shop*, drop-in, school-based.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
DISCLAIMER	i
COPYRIGHT	i
CONTACT DETAILS.....	i
EXECUTIVE SUMMARY	ii
<i>Objectives</i>	ii
<i>Data sources</i>	ii
<i>Study selection</i>	ii
<i>Data extraction and synthesis</i>	ii
<i>Key results and conclusions</i>	ii
<i>Access and utilisation</i>	iii
<i>Mental health</i>	iii
<i>Emergency department use</i>	iii
<i>Health outcomes</i>	iii
<i>New Zealand studies</i>	iv
<i>Summary</i>	iv
<i>MeSH headings</i>	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES	viii
LIST OF ABBREVIATIONS	ix
GLOSSARY OF TERMS	x
CHAPTER 1: BACKGROUND	1
INTRODUCTION.....	1
REVIEW SCOPE.....	1
<i>Why is primary care important?</i>	1
<i>Why does the health of young people need special attention?</i>	1
<i>What is the current health status of New Zealand's young people?</i>	2
<i>What factors limit youth access to mainstream primary care services?</i>	2
<i>What alternatives to General Practice primary care services are available?</i>	2
<i>What evidence is used in this review?</i>	3
<i>Background on school-based health centres</i>	3
REVIEW OBJECTIVES	3
REPORT STRUCTURE.....	4
CHAPTER 2: METHODOLOGY	5
STUDY SELECTION	5
<i>Inclusion criteria</i>	5
<i>Exclusion criteria</i>	5
SEARCH STRATEGY	6
PRINCIPAL SOURCES OF INFORMATION	6
<i>Bibliographic databases</i>	6
<i>Review databases</i>	6
<i>Other sources</i>	6
SEARCH TERMS USED.....	7
SELECTION AND APPRAISAL.....	7
DATA EXTRACTION.....	7
LIMITATIONS OF THE REVIEW	8
CHAPTER 3: EFFECTS OF YOUTH-TARGETED PRIMARY CARE ON ACCESS AND UTILISATION OF SERVICES	9
INTRODUCTION.....	9
<i>Study design</i>	9
<i>Study setting</i>	9
<i>Study samples</i>	10
APPRAISAL OF STUDIES.....	10

<i>Studies of access and utilisation without a comparator group</i>	10
<i>Access to and utilisation of health care with comparator of non-SBHC schools</i>	11
<i>Access and utilisation using a comparator population of non-SBHC users within the same school</i>	15
DISCUSSION	18
<i>Impact on access and utilisation</i>	18
<i>Demographics of SBHC use and access</i>	18
<i>Gender</i>	19
<i>Age</i>	19
<i>Ethnicity</i>	19
<i>Socio-economic status</i>	19
<i>High risk youth</i>	19
<i>Special Needs</i>	20
<i>Rural</i>	20
<i>Barriers to access</i>	20
<i>Factors increasing access</i>	20
<i>Impact of SBHCs on access and utilisation of mental health services</i>	21
<i>Summary</i>	21
CHAPTER 4: EFFECTS OF YOUTH-TARGETED PRIMARY CARE ON USE OF EMERGENCY/AFTER-HOURS SERVICES	33
INTRODUCTION	33
APPRAISAL OF STUDIES	33
DISCUSSION	35
CHAPTER 5: THE EFFECT OF YOUTH-TARGETED PRIMARY CARE ON HEALTH OUTCOMES	41
INTRODUCTION	41
APPRAISAL OF STUDIES	41
DISCUSSION	43
CHAPTER 6: NEW ZEALAND STUDIES RELATED TO YOUTH HEALTH AND PRIMARY CARE	47
<i>Included NZ studies</i>	47
<i>Additional NZ studies (using broader inclusion criteria)</i>	48
DISCUSSION OF NEW ZEALAND STUDIES	51
<i>The contribution of New Zealand research</i>	52
<i>The paucity of New Zealand youth health outcome evaluations</i>	52
CHAPTER 7: GENERAL DISCUSSION, SUMMARY AND CONCLUSIONS	59
GENERAL DISCUSSION	59
<i>Methodological issues</i>	59
<i>How applicable are the US studies to New Zealand?</i>	60
<i>Challenges of research in youth-specific primary health</i>	60
<i>Limitations of current research base</i>	61
SUMMARY	61
<i>Access and utilisation</i>	61
<i>Mental health</i>	61
<i>Emergency department use</i>	62
<i>Health outcomes</i>	62
<i>New Zealand studies</i>	62
CONCLUSIONS.....	63
REFERENCES	65
APPENDIX 1	69
SEARCH STRATEGIES.....	69
<i>Medline</i>	69
<i>Embase</i>	69
<i>Cinahl</i>	70

<i>Psychinfo</i>	71
<i>Other Sources</i>	71
APPENDIX 2	73
SOURCES SEARCHED	73
<i>Bibliographic databases</i>	73
<i>Review databases</i>	73
<i>Library catalogues</i>	73
<i>Websites</i>	73
<i>Search engines</i>	73
<i>Other</i>	73
APPENDIX 3	75
NEW ZEALAND EXPERTS IN THE FIELD CONTACTED.....	75
APPENDIX 4	77
RETRIEVED STUDIES EXCLUDED FOR REVIEW (EXTERNAL TO NEW ZEALAND).....	77
APPENDIX 5	81
NEW ZEALAND STUDIES IDENTIFIED THAT WERE NOT INCLUDED IN THE APPRAISAL OF NEW ZEALAND LITERATURE	81

LIST OF TABLES

Table 1. The impact of youth-targeted primary care on access and utilisation	22
Table 2. The impact of youth-targeted primary care on use of emergency departments.....	36
Table 3. The impact of youth-targeted primary care on health outcomes	44
Table 4. New Zealand studies related to youth and primary health care.....	53

LIST OF ABBREVIATIONS

95%CI	–	95% Confidence Interval
GP	–	General Practice or General Practitioner (Family Doctor)
HMO	–	Health Maintenance Organisation
NZ	–	New Zealand
OR	–	Odds Ratio
SBHC	–	School-Based Health Centre
SD	–	Standard Deviation
SES	–	Socio-Economic Status
STD	–	Sexually Transmitted Disease
USA or US	–	United States of America
WHO	–	World Health Organisation

GLOSSARY OF TERMS

Access - Ease of use/approachability of a health service for someone requiring health services including aspects such as cost, distance to travel, opening hours and cultural appropriateness.

Before and after study - A situation in which the investigator compares outcomes before, and after, the introduction of a new intervention.

Bias - Deviation of results or inferences from the truth, or processes leading to such deviation.

Cohort study - The analytic method of epidemiological study in which subsets of a defined population can be identified who are, have been (retrospective), or in the future (prospective) may be exposed, or not exposed, or exposed in different degrees, to a factor or factors hypothesised to influence the probability of occurrence of a given disease or outcome.

Confidence interval (CI) - A range of values assumed with a specified degree of confidence to include a population parameter.

Confounder - A third variable that indirectly distorts the relationship between two other variables.

Cross-sectional study - A study that examines the relationship between diseases (or other health-related characteristics) and other variables of interest as they exist in a defined population at one particular time.

Descriptive study - A study concerned with, and designed only to describe the existing distribution of variables, without regard to causal or other hypotheses.

External validity - The extent to which the results of a trial provide a correct basis for generalisations to other circumstances. Also called "generalisability" or "applicability".

Generalisability - Applicability of the result to other populations.

Grey Literature - Documents produced by all levels of government, academics, business and industry, in print and electronic formats, but not controlled by commercial publishers.

Health Maintenance Organisation (HMO) - see managed care provider.

ICD - The International Classification of Diseases (Version 9.0). This system categorises and classifies diseases in a systematic manner and is internationally recognised and utilised.

Independent variable - The variable manipulated by the experimenter.

Internal validity - The extent to which the design and conduct of the trial eliminate the possibility of bias.

Linear regression - Analysis of data that takes into account two variables simultaneously.

Managed care provider - A provider of comprehensive pre-paid health care (a form of health insurance) in the USA designed to maximise cost efficiency. Care may be provided by a Health Maintenance Organisation (HMO) or Preferred Provider Organisation (PPO).

Matching - Selecting participants or groups (e.g. schools) possessing similar characteristics to serve in different conditions of a study; a method of reducing variability between groups to reduce experimental error.

Mean - Measure of central tendency; the arithmetic average.

Medicaid - Free medical care available to the most deprived members of the population under 65 years – set with relation to national poverty level (level varies between States).

Multiple regression - Any analysis of data that takes into account more than two variables simultaneously.

Odds Ratio (OR) - A measure of the degree or strength of an association. In a case control or cross-sectional study, it is measured as the ratio of the odds of exposure among the cases to that among the controls.

One stop shop - A term that has been used frequently in New Zealand youth health policy to refer to a comprehensive youth centre which broadly deals with all primary health care needs as well as services such as an employment service, counselling, drop-in centre etc.

P value - If no association really exists, statistical tests of significance are used to determine the probability that an association could have occurred by chance alone. By convention, if the p value is less than 0.05, then the association is considered to be statistically significant.

Rangatahi - Youth (in Maori).

Reduced price lunches - Acts as a proxy for socio-economic deprivation, lunches available at reduced price or free to school students with a lower family income pre-set in relation to the national poverty level.

Reliability - The results of a test or measure are identical or closely similar each time it is conducted.

Risk factor - An exposure or aspect of personal behaviour or lifestyle, which on the basis of epidemiological evidence is associated with a health-related condition.

Selection bias - Error due to systematic differences in characteristics between those who are selected for study and those who are not.

Special needs - A term used in health and education arenas to refer to young people with physical or mental disabilities.

Stepwise regression - Analysis of data that takes potential confounding variables into account sequentially.

Systematic review - Review that uses a systematic and structured approach in its search for relevant studies and its appraisal of literature.

Trend analysis - The statistical assessment of linear and higher-order trends (e.g. quadratic, cubic).

Utilisation - A measure of use of a health service – this can be in terms of a rate (e.g. mean visits to Dr/year) or a percentage of potential users who visit a service (e.g. 66% of school population were school-based health clinic users).

Validity - The extent to which a variable or intervention measures what it is supposed to measure or accomplishes what it is supposed to accomplish.

Variance - A measure of the variation shown by a set of observations, defined by the sum of the squares of deviation from the mean, divided by the number of degrees of freedom in the set of observations.

Young people - WHO definition: 10 to 24 year olds. In this review used interchangeably with youth.

Youth-specific primary care - Primary care that deliberately targets 10-24 year olds in both the types of services offered as well as the manner in which they are offered.

Chapter 1: Background

INTRODUCTION

The Ministry of Health commissioned this report to summarise international and New Zealand evidence on youth-specific primary care in relation to access, utilisation, mental health, health outcomes and emergency department use.

REVIEW SCOPE

This review is a result of a request from the Ministry of Health to undertake a systematic review of research on the effectiveness of targeted primary health services for youth. The Ministry sought information on health outcomes as well as the effects of youth-targeted primary care services on access, utilisation and mental health. This report hopes to contribute to recommendations by the Ministry of Health in conjunction with the Ministry of Youth Affairs to the New Zealand Youth Health Strategy. Of particular importance to the Ministry of Health are services that demonstrated better health access, service utilisation and outcomes for the most needy rangatahi/youth in the population. The scope of the review reflects the Ministry of Health's priority for evidence-based health programme interventions.

A further objective of this review is to encourage and inform the planning of rigorous health outcome-based evaluations of programmes targeting youth in the future.

Why is primary care important?

A nation committed to the health of all its citizens must attempt to provide health care that is accessible, acceptable and appropriate for each group. There is evidence of concordance between the strength of a primary care system and indicators of population health status (Politzer and Yoon 2001). Primary care is the most significant medical care variable associated with better health status within the United States (Shi 1992).

Research evidence links access to a regular primary health care provider with improvements in health status, regardless of income (Politzer and Yoon 2001). A study examining access to ambulatory care for adolescents (Bartman et al. 1997), demonstrated that adolescents lacking a regular source of care were at greater risk of unmet need (reporting of symptoms and not seeking health care as defined by Bartman et al. 1997). Inequities in health status and unmet need may relate more to lack of a usual source of care than socio-economic circumstances (Bartman et al. 1997).

Why does the health of young people need special attention?

The World Health Organisation (WHO) defines 'youth' as persons aged between 15 and 24 years old and 'young people' as those between the ages of 10 and 24 years. Adolescence is described as the period between 10 and 19 years. This report considers all people between the ages of 10 and 24 years. To avoid repetition, the terms 'youth' and 'young people' are used interchangeably. Within specific studies the terms 'adolescents' and 'teenagers' are used where appropriate.

Adolescence and youth is a period between childhood and adulthood. Traditional health services targeted for children (paediatrics) have an arbitrary cut off around 15 years of age. Youth are served by adult targeted services without acknowledgement of many issues and health risks which differ from adults. Specific developmental tasks at this stage are self-identity and sexual identity, autonomy, acceptance and relationships with peers as well as establishment of a role in lifestyle and vocation. Developmental, social, environmental and lifestyle factors are major threats to the health of young people and are largely preventable (Watson 2001).

Health services need to provide effective health interventions for all young people. Clearly the health needs of a 12 year old are very different to those of a 20 year old. It is possible that health services oriented to youth and with a developmental perspective are a requisite for improved youth health status.

What is the current health status of New Zealand's young people?

While a number of publications and internal reports summarise this more comprehensively (Maskill 1991; New Zealand, Ministry of Health 1995; New Zealand, Ministry of Health 2002), a brief overview is helpful. New Zealand mortality statistics show 10 to 24 year olds to be the only age group not to have had a significant reduction in death rates since 1960 (Watson 2001). Currently, New Zealand's young people have rates of drug and alcohol abuse, suicide/self-harm and adolescent pregnancy that are higher than most developed countries (New Zealand, Ministry of Health 2002).

The major cause of death and hospitalisation among New Zealand young people is injury. Injury, including motor vehicle crashes and suicide, accounts for 80% of deaths in 16 to 24 year olds (New Zealand, Ministry of Health 2002). Most of these injuries are preventable.

There are subgroups of young people at greater risk. Young men have significantly higher rates of injury (accidental and intentional) than young women. The death rate for Maori aged 12 to 14 years is consistently higher than for non-Maori, and Maori aged 15 to 24 years are three times more likely to be killed in a motor vehicle crash than are non-Maori of this age group (New Zealand, Ministry of Health 2002). Young Pacific Islands women have abortion rates over two times higher than those for Maori, and over three times higher than for European/Other youth (New Zealand, Ministry of Youth Affairs 1994). The prevalence of overweight and obesity is higher in Pacific and Maori young people than in European/Other ethnic groups (New Zealand, Ministry of Health 2002).

Mental health is a major concern for this age group. Cohort studies based in Dunedin and Christchurch (Feehan et al. 1993; Fergusson et al. 1993), describe rates of mental health disorders of over 20% among 15 year olds. It has been estimated that between 10 and 20% of 10 to 19 year-olds require professional mental health care, yet only a small proportion receive it (New Zealand, Ministry of Youth Affairs 1994). Most common mental health problems for 15 to 19 year old New Zealanders are related to alcohol and drugs. Drugs most commonly used by adolescents are tobacco, alcohol and marijuana (New Zealand, Ministry of Youth Affairs 1994). Smoking tobacco is more common now than it was in 1992. Of 15 year olds, 14 to 16% are now daily smokers. Among 14 to 15 year old Maori school girls, 37% report being daily smokers (New Zealand, Ministry of Health 2002).

What factors limit youth access to mainstream primary care services?

This question is pivotal to the review, and is explored in detail in the appraisal of papers and discussion sections. Problems described by 18 year old New Zealanders with their own general practitioners includes inconvenient times, cost, embarrassment with the doctor and/or nurse, concerns about confidentiality and difficulty seeing a doctor (Murdoch and Silva 1996). Other issues that youth identify include judgmental attitudes of staff, whether a service is youth oriented, cultural appropriateness and the atmosphere of a health clinic (Clark 2001; Geddes 1997).

Barriers to access are detailed further in a Ministry of Health publication (New Zealand, Ministry of Health 1995) which summarises how young people perceive existing primary health services, major health issues for young people and groups of young people with particular health service needs.

What alternatives to General Practice primary care services are available?

Currently, in New Zealand the vast majority of young people (88%) use a general practice for primary care services (Murdoch and Silva 1996). Other options include student health, family planning and STD clinics, emergency department and after-hours services and in some parts of New Zealand school-based nurse and primary health services as well as youth/one stop shop health centres.

What evidence is used in this review?

Most research in this area is set in the United States. The US health system is largely based on private insurance and health care providers. Only the poorest are eligible for State provided health care or subsidy with Medicaid. The US healthcare setting is clearly very different to the New Zealand one. Caution is needed in applying findings of US research to New Zealand.

Background on school-based health centres

The vast majority of the research into outcomes in youth-targeted primary care has been undertaken within school-based health clinics (SBHCs). It is therefore, important to understand the context of this form of primary care. SBHCs are the main method of providing youth-specific primary care in the USA (although it is generally limited to school students), and has also been used in several high schools in New Zealand. It therefore tends to act as a proxy for youth-targeted primary care.

There are over 1,300 SBHCs in the US. They are generally located on school grounds and offer services to students in that school (Morone et al. 2001). Most SBHCs offer mental health support and referral services as well as drug/alcohol cessation programmes in addition to primary care services. They are staffed by nurse practitioners as well as part-time adolescent physicians and paediatricians (Fothergill and Ballard 1998).

Historically, they arose in the 1960s and 1970s from community initiatives recognising health problems facing youth from poor families (Morone et al. 2001), and have been funded with support of non-profit organisations such as the Robert Wood Johnson Foundation as well as public funding. There are often strict criteria regarding set-up and functioning for SBHC start-up grants (Dryfoos 1995; Santelli et al. 1996c).

This background is significant for the review in several ways. Evaluations have generally not used rigorous scientific method (e.g. randomisation of SBHCs), as they have instead been prioritised to areas of high need and have only secured funding for programmes and not evaluation. Populations served by SBHCs have higher needs (e.g. uninsured or from disadvantaged backgrounds) than those they are compared with, creating bias in evaluations. The social context of political and religious objection to comprehensive sexual health services within SBHCs has also had implications on the effectiveness of SBHCs, (Morone et al. 2001), particularly on reproductive health outcomes as discussed in **Chapter 5**. Comprehensive SBHCs are not equivalent to the school nurse services already provided in many New Zealand high schools.

REVIEW OBJECTIVES

- to assess the impact of youth-specific primary care on access, utilisation, health outcomes, emergency department use and mental health
- to describe factors that increase access and utilisation, and improve health status in delivery of primary care to youth
- to provide a summary of this evidence in a format that is instructive to those forming the New Zealand Youth Health Strategy
- to encourage outcome evaluations of youth health interventions.

REPORT STRUCTURE

This report first provides contextual information about principles of adolescent health, health status and barriers that they may face in mainstream services. The methods used and limitations of the review follow (see **Chapter 2**). Subsequent sections (**Chapters 3-6**) evaluate the impact of youth-targeted primary health services. Each section introduces main issues, presents the study appraisals and provides a discussion of the results. This information is supplied in tabular format at the end of each chapter. A separate chapter (**Chapter 6**) summarises pertinent studies performed in New Zealand related to youth and primary health care. A final chapter (**Chapter 7**) makes a general discussion, summarises findings and makes conclusions. Recommendations are not included here, as they are more appropriate from experts and policy makers involved in primary health service provision for youth.

A number of studies appear in several chapters as they evaluated more than one outcome. They are repeated in the evidence tables, and a brief summary of the study is provided in the text after the study is first detailed.

Chapter 2: Methodology

STUDY SELECTION

Inclusion criteria

This review is restricted to studies that evaluate primary health service provision targeted for people aged 10 to 24 years (WHO definition of youth). Studies with target age groups that bridged this age range were included if the mean age of participants fell within this range.

This review was to evaluate recent evidence of youth-targeted primary care services. It was restricted to evidence published between 1 January 1990 and 31 August 2001.

Studies were included if they aimed to evaluate outcomes of general and comprehensive primary health youth-targeted services. There is a large body of research on issue specific areas relevant to youth and adolescent health (drugs and alcohol, reproductive health, sexual health, mental health). This review considered evaluations of these topics as outcomes only if they were part of a comprehensive primary care service.

Outcomes

Issues of access (and utilisation as a proxy commonly used to measure access to a service) to youth-targeted primary care services in comparison to traditional primary care service providers were considered, as well as individual services offered from within primary care such as mental health care.

Outcomes could include specific issues such as pregnancy prevention, contraceptive use, or asthma control.

Outcomes related to mental health status or accessing/utilisation of mental health services provided by youth-specific primary care were included.

Studies were included that quantitatively evaluated effectiveness of youth-specific primary care. This was generally in the context of post-intervention outcomes using cross-sectional study designs – e.g. after introduction of a SBHC into a school.

Studies required samples of at least 20 participants.

Exclusion criteria

Research papers were excluded if they:

- used an intervention which was not part of a youth-specific primary health programme (e.g. mental health promotion within schools was excluded)
- were correspondence, conference proceedings, abstracts
- did not clearly describe their methods and results, or had significant discrepancies
- were published before 1990
- had no language exclusion
- had additional studies
- had studies that provided background contextual information for this report. These studies were not appraised in detail.

A number of New Zealand studies were identified using the search strategy presented in **Chapter 2**. Only two studies met the above criteria, although a number of relevant qualitative and quantitative studies have been performed within New Zealand. We used more inclusive criteria to include relevant qualitative research related to young people and primary health care in New Zealand for **Chapter 7**.

Although any additional studies cannot be considered of equivalent evidence within the framework of a systematic literature review, they are likely to add validity to international research for the New Zealand context. They are important, in that they represent views and preferences of New Zealand. Within this section, the broadened criteria used for inclusion were studies that:

- describe outcomes (access, utilisation, health outcomes and impact of other health services) of youth-targeted primary care, (using the age criteria described above)
- discuss issues related to youth-targeted primary care such as perceived health needs, access barriers or client satisfaction.

SEARCH STRATEGY

A systematic method of literature searching and selection was employed in the preparation of this review.

Searches were done in August and September 2001 for material published in 1990 and onwards. There was no restriction by language. Results were loaded into an Endnote library computer programme. A number of key articles were identified from the searches and a citation search carried out for subsequent citations to each reference.

PRINCIPAL SOURCES OF INFORMATION

The following databases were searched using the search strategies outlined in **Appendix 1**.

Bibliographic databases

Medline
Embase
Current Contents
Cinahl
Eric
Social Science Citation Index
Cochrane Controlled Trials Register
Index New Zealand

Review databases

Cochrane Database of Systematic Reviews
Database of Abstracts of Reviews of Effectiveness
NHS Economic Evaluation database
Health Technology Assessment database
Evidence-based Reviews – ACP Journal Club

Other sources

Major online library catalogues.

Evaluated website resources with a youth health focus.

New Zealand, Australian, British, Canadian, and United States government youth health departments and related agencies.

Reference lists of papers retrieved during the course of the search.

Subject experts in the field (see **Appendix 3**).

Electronic contents pages of the *Journal of School Health* and the *Journal of Adolescent Health* were scanned for relevant publications.

A complete list of sources searched for this review is given in **Appendix 2**.

SEARCH TERMS USED

Index terms from Medline (MeSH headings): school health services, comprehensive health care, program evaluation, outcome assessment (health care), randomized controlled trials, cohort studies, meta-analysis, controlled clinical trials, longitudinal studies, evaluation studies, follow-up, prospective studies.

Index terms from Embase: quality of life, evaluation, health survey, treatment outcome, outcomes research, health status, health care quality, school health service.

Index terms from Psychinfo: evaluation, measurement, mental health program evaluation, treatment effectiveness evaluation, program evaluation, treatment outcomes, school facilities, schools, mental health services, high school students, primary health care.

Descriptors and identifiers from Eric: program effectiveness, program evaluation, school health services, school-based health clinics, comprehensive school health programs.

The above index terms were used as keywords in databases where they were not available and in those databases without controlled vocabulary.

Additional keywords (not standard index terms) were used in all databases: (school* or tertiary or university or college or teen* or adolescent* or youth or juvenile) AND (center* or center* or clinic or clinics or service*), effective*, outcome*, evaluate*, one stop shop*, drop-in, school-based.

Complete strategies for the major databases are given in **Appendix 2**.

Following the main searches small follow-up searches were done across the major bibliographic databases (Medline, Embase, Current Contents, Psychinfo) for major studies on the relationship between access and health status. These searches used very simple strategies to locate references with the words *access** AND *health care* OR *health status* OR *health service** in the title of the article. These strategies are not included in **Appendix 2**.

SELECTION AND APPRAISAL

The search identified 443 references. From reading abstracts, retrieving citations from relevant studies, as well as additional material supplied by the Ministry of Health, the reviewer identified 80 research studies as potentially eligible for inclusion and which were retrieved as full text. The inclusion and exclusion criteria were applied to select the final group of 23 primary studies for critical appraisal and inclusion in the evidence tables. A further six NZ studies related to youth, and primary care were included with more broad criteria and appraised to provide local perspectives. Included studies and other cited publications (e.g. those providing background material) are presented in the **References**. Excluded retrieved studies are presented in **Appendix 4** and excluded retrieved studies from NZ are presented in **Appendix 5**.

DATA EXTRACTION

Articles were formally appraised using the schedule developed by the Group Health Cooperative of Puget Sound 1996, and adapted by the New Zealand Guidelines Group 1997 of the National Health Committee. Summaries of appraisal results are presented in both text and tabular form, and conclusions drawn which were dependent on study design and any limitations noted.

The level of evidence was graded using an adapted version of the US Preventive Services Task Force protocol (U.S. Preventive Services Task Force 1989). The following levels of evidence were used in this review:

- I Evidence obtained from at least one properly designed randomised controlled trial or evidence obtained from a properly designed and conducted meta-analysis
- II - 1 Evidence obtained from well-designed controlled trials without randomisation
- II - 2 Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one centre or research group
- II - 3 Evidence obtained from multiple time series with or without intervention
- III Evidence obtained from descriptive or cross-sectional studies
- IV Opinions of respected authorities based on consensus or clinical experience

A separate section of the report appraises NZ studies of youth health that do not fit the inclusion criteria described. Some of these studies used a qualitative methodology and were appraised using two checklists for appraisal of qualitative research (Anonymous Accessed on 15.12.01; Health Evidence Bulletins - Wales Accessed on 15 December 2001). No evidence grading could be assigned to these studies.

LIMITATIONS OF THE REVIEW

This report has used a structured approach to review the literature. However, there are some inherent limitations with this approach as follows:

- articles included in this review were limited to those published between 1 January 1990 and 31 August 2001. Papers prior to 1990 were excluded as more recent evidence was required
- the majority of studies that fitted the inclusion criteria and appraised in the main body of this review were conducted in the USA, which may limit applicability of evidence to the New Zealand setting. The reduced external validity of US-based research (the researched group is not fully comparable to New Zealand youth) is not mentioned in discussion of articles appraised unless the sample population is particularly restricted
- for a detailed description of the interventions and evaluation methods, and results used in the studies appraised, the reader is referred to the original papers cited
- this review has greatly benefited from the advice provided by the external peer reviewer. However, it has not been exposed to wider peer review.

Chapter 3: Effects of youth-targeted primary care on access and utilisation of services

INTRODUCTION

Access to health services is a significant factor in youth health. Improved access to health care has been shown to reduce risky behaviours, improve health status indicators, and is important in its own right as an indicator of equity (Klein et al. 1992). Many of the studies evaluating youth-targeted health services consider issues of access to services. An underlying assumption in using access and utilisation as outcome markers of youth-targeted primary health care is that increased access is associated with improvement in health status.

Supporting this assumption, research evidence links access to a regular source of primary care with improvement in health status, regardless of income (Andrulis 1998; Frenk 1998; Politzer and Yoon 2001). Disparities in access to health care at a population level can be reduced by providing patients with a usual and regular source of care (Politzer and Yoon 2001).

Access and utilisation of health services are often used interchangeably, with utilisation often used as a proxy for access; that is, use of a service is seen as a marker that it is accessible. However, access is more than using a health service. It involves capacity to provide needed care as well as whether services are used effectively (Klein 2000). Some authors have distinguished the two concepts by describing the former as unmet need (Bartman et al. 1997; Klein et al. 1999). For example, a person experiences a symptom for which they would like medical help, but does not access a health service due to access barriers such as cost, distance or cultural inappropriateness of service providers. Studies in this section use utilisation of services as a marker of access as well as measure unmet health needs among adolescents.

Mental health is one of the least accessed services by youth. Many of the health problems of youth are related to mental health – high-risk behaviours, depression, suicidality and self-harm. Most comprehensive primary care services that target youth recognise this, and include mental health practitioners and services within the primary care service. Eight studies described and evaluated access and utilisation of mental health services within primary care.

Study design

Seventeen studies were identified that fulfilled the inclusion criteria in the area of access and utilisation of health services.

The majority of these were of evidence level III using descriptive cross-sectional designs. There were no studies of evidence level II-1 or above.

Study setting

All the studies considered school-based health centres (SBHCs) as the provider of youth-targeted primary care with the exception of a client satisfaction survey performed in New Zealand. It considers a comprehensive youth-primary health service targeting at-risk urban youth (Geddes 1997). All studies were set in the United States except two from New Zealand which are detailed in **Chapter 6** (Chavasse et al. 1995; Geddes 1997).

Study samples

The 17 studies identified used a variety of samples and comparators. Four studies were descriptive of users of a primary youth health service without any other comparator population. Six studies described young people using a SBHC and used a comparator of young people without access to a SBHC (either at schools without a SBHC or using national data). Seven further studies described youth who were users of a SBHC and compared them with youth at the same school who did not use the school health clinic. Appraisals of the studies are grouped according to their methodology and use of comparator groups. See **Table 1 pages 22-32** for details of studies discussed below.

APPRAISAL OF STUDIES

Studies of access and utilisation without a comparator group

Four studies considered students' access, knowledge and use of services through self-reporting without any comparator groups (Brindis et al. 1995; Chavasse et al. 1995; Geddes 1997; Jepson et al. 1998). Outcomes measured included knowledge about the SBHC or youth health services, reported barriers to access, reported use of the centre and satisfaction with services.

These descriptive studies cannot provide strong evidence about the impact of the intervention because they do not use a comparator population of young people who do not have access to a SBHC. They can indicate possible youth preferences for services and describe reported access and utilisation barriers for their samples.

Brindis et al. (1995)

Brindis et al. (1995), surveyed 2,860 students with a previously validated questionnaire at three urban high schools in California. The target populations were all school students. There was a 66% response rate (n=2860) with absenteeism the primary reason for non-participation.

Participants had an age range of 14 to 18 years. Ethnically, they were 48% Hispanic, 21% African-American, 16% Pacific/Asian and 8% White. There were no significant differences in gender and ethnicity between the sample and target populations. Multiple logistic regression analysis assessed the influence of different factors on SBHC utilisation, including health insurance status.

There was no significant difference in use of medical services at the SBHCs according to insurance status, and significantly more students with Medicaid used mental health services ($p < 0.05$). Factors most likely to predict SBHC clinic use were if students were white, female, depressed, older than 16 years and with a mother who had completed college. Users were less likely to be Asian/Pacific Islanders. Students without health insurance were more likely than other students to not receive care from any source ($p < 0.01$), and to indicate that they did not seek needed care because it cost too much. Main reasons for using the SBHC were because they could trust it (37%), it was easy to get to (36%) and they found care helpful (31%).

The study's strengths include a validated survey tool that appears unbiased and comprehensive, and adequate sample size. It would be strengthened by use of a comparator group without access to a SBHC, so that differences in utilisation could be ascribed to the SBHC specifically. The ethnic composition of participants and location of the three schools in one region reduce external validity.

Jepson et al. (1998)

Jepson et al. (1998), performed a cross-sectional study reviewing mental health services within one SBHC in an urban high school. All the clinical records for the calendar year of 1992 were reviewed, and the demographic details plus the primary diagnosis for 265 students who used the mental health services. 72% were Black, 21% Hispanic and 7% Other.

Of the total 4,852 consultations to the SBHC, 1,002 were for mental health services, with a mean visit rate of 4/year. Nearly all students were self-presented. The primary mental health consultations in descending order of prevalence were pregnancy and sexuality related (e.g. miscarriage and abortion counselling), depression/dysphoria and suicidal ideation, diagnoses related to conflict and violence, and drugs/alcohol use.

The study is limited by reduced external validity – it describes one school over one year with no control group without access to a SBHC. The methods used for data extraction are not validated. Overall, this study suggests high utilisation of mental health services by students with access to a SBHC. The diagnoses reflect the range of high risk behaviours and needs of adolescents at this school.

Chavasse et al. (1995)

Chavasse et al. (1995), performed a three phase cross-sectional study describing a school doctor clinic in a New Zealand secondary school. It is described in detail in **Chapter 6** and is also summarised in **Table 1 pages 22 - 32**. Female, Maori and European students used the school clinic significantly more than other students, while Asian and Indian students were low clinic users. A client satisfaction survey gave the three main reasons for accessing the clinic as no cost, easy physical access and 'thought the doctor could treat them'. Of survey respondents, 95% thought the clinic was a 'good idea' because of its easy access, low cost and confidential service. Most common reasons students gave for not using the SBHC were because they were healthy, and because they already had a place to go for health care.

Geddes (1997)

A cross-sectional study performed in NZ (Geddes 1997) is described in detail in **Chapter 7** and in **Table 1 pages 22 - 32**. It used a satisfaction survey to describe views of 115 youth clients at a youth-targeted primary care service. Response rate was 93%. Reasons for utilisation of the service (in descending order of frequency) were no cost, friendly staff, comfortable atmosphere, convenient and youth oriented. A third of the sample said that if this service was unavailable, they would not go anywhere for their presenting health problem on the day of survey. The survey was unvalidated, so applicability of this study to other populations is limited.

All the studies in this section are methodologically limited by not having a comparator group. They are descriptive of the users of a youth-specific primary care service, but cannot define whether the access and utilisation by youth are due to this intervention or not.

Access to and utilisation of health care with comparator of non-SBHC schools

Seven studies considered access, utilisation and attitudes of young people in relation to SBHCs using comparator schools without access to a SBHC (Kaplan et al. 1998; Santelli et al. 1996b; Zimmer-Gembeck et al. 1997), or comparing utilisation with national figures (Anglin et al. 1996; Crosby and St Lawrence 2000; Kisker and Brown 1996). The usefulness of these groups as comparator populations depends on how similar they are to the sample population in any aspect that could affect their accessing or use of health services. The minimum demographic details that should be aimed for in matching would consider the sample and comparator populations, age structure, ethnicity, gender balance, geographic location and socio-economic status. The usefulness of comparator populations is discussed within each study appraisal.

Kaplan et al. (1998)

Kaplan et al. (1998), performed a retrospective cohort study comparing use of physical and mental health services for 240 adolescents enrolled in managed care over three years with access to a SBHC – with 116 adolescents enrolled in managed care without access to a SBHC. The adolescents were matched for age, sex and socio-economic status. Age range of the cohort was 14 to 18 years. Information on consultations of students was obtained from International Classification of Diseases (ICD) coding given at consultation for SBHCs, and by review of individual clinical records in managed care clinics.

Adolescents with access to a SBHC were greater than 10 times more likely to make a mental health or substance abuse visit than those without access to a SBHC. Specifically, 97% of the 314 mental health visits and all the substance abuse visits in this study occurred in the group with access to a SBHC. Adolescents with access made at least a third significantly fewer visits to after-hours care, and overall, made one additional medical consultation per year. Adolescents with access to a SBHC were more likely to have had a comprehensive health supervision visit than those without access. Differences in diagnoses included a relatively greater proportion of gynaecology visits at SBHCs, while a greater proportion of injuries, poisonings and musculo-skeletal diagnoses occurred at the managed care clinics, which provided extended opening hours.

This study did not provide ethnicity information. The enhanced accessing of services described here could be due to greater geographical accessibility or to the service being youth-specific. The two are not separable using this methodology. The sample and comparator populations are, however, more likely to be comparable demographically by sharing the same type of health insurance, and being located in the same geographic area although this limits generalisability to other areas.

Overall, this robust study provides evidence for increased access to primary health care for youth through SBHCs. It underlines improved access for mental health and substance abuse care, and suggests that with comprehensive and accessible primary care, use of after-hours services can be reduced.

Santelli et al. (1996b)

Santelli et al. (1996b), used a cross-sectional study design to examine 3,528 students' attitudes toward SBHCs, and factors that influence these attitudes. Nine schools with SBHCs and four comparison schools without SBHCs were surveyed using a validated survey tool. School principals selected a representative sample of classrooms in each school.

Health centre schools had a slightly higher proportion of African-American and female students. SBHC enrollees were more likely to be African-American, attending special education classes, and to have Medicaid insurance. The demographic make-up of the samples was similar to that in the school census.

There was an overall high level of reported support found for the SBHCs. This increased with direct knowledge of the SBHC – i.e. highest in SBHC enrollees and lowest in schools without SBHCs. There was greater student support for contraceptive services, and distribution on site by SBHC enrollees. Reasons for non-enrolment in the school health centre included (in descending order of priority): satisfaction with current provider, forgetting to send in the consent form, being healthy and lack of knowledge.

Correlates with health centre enrolment identified by logistic regression included African-American ethnicity, attending one or more special education classes, reporting one or more medical conditions, peer influences and being a member of a school club.

Study limitations include reduced internal validity as comparison schools differ from health centre schools demographically. This could mean that the differences described between the populations with and without SBHC access, were due to these – e.g. a different ethnic or socio-economic background rather than the intervention. Classroom sampling is not randomised. Overall, this study demonstrates high support by adolescents for youth-targeted services. It shows the school health centre is utilised most by those with chronic illness, special education needs and by African-American students.

Anglin et al. (1996)

Anglin et al. (1996), studied high school students' use of medical, mental health and substance abuse services at SBHCs, and compared utilisation patterns with national data of traditional sources of health care such as general practitioners and paediatricians. This cross-sectional study reviewed computer records of all consultations of 3,818 students in three SBHCs in Denver, Colorado over four years. At initial visit, students were aged from 14 to 18 years and ethnically were 22% Black, 44% White and

28% Hispanic. There were no significant demographic differences between health centre users and the total school population.

Of SBHC users, 94% had a medical consultation, 25% a mental health visit and 8% a substance abuse related visit. Users of medical services had 3.3 mean annual visits compared to the national average of 2.3 annual visits to an office-based physician. Students using mental health and substance abuse services had a higher mean visit rate in line with the greater need for follow-up (5.8 per year for mental health and 6.8 per year for substance abuse). Mean duration of medical visits was 21 minutes compared with a national mean of 10 minutes.

Limitations to this study include lack of validation of the accuracy of computer records, no discussion of data extraction methods used, insufficient information to duplicate results and reduced external validity as the study considers three SBHCs in the same region. Comparison of utilisation data with traditional sources of care is limited by using national data with many potential confounding differences such as ethnic composition and socio-economic backgrounds. Comparison with national data was further limited by unavailability of information on mental health and substance abuse services. A retrospective case review of matched controls using office-based (GP and Paediatrician) care would have made this a much stronger study.

Overall, this study demonstrates increased utilisation of medical services with access to a SBHC, and that these services are longer and possibly more thorough.

Zimmer-Gembeck et al. (1997)

Zimmer-Gembeck et al. (1997), performed a cross-sectional survey of nearly 14,000 high school students. They used a previously validated written survey with some unpiloted questions related to health care access. Fifteen of the participating schools (30%) had established SBHCs. The sample group had equal numbers of males and females aged between 14 and 18 years. Of these, 81% identified as white and 2% as African-American. The remainder was a variety of ethnic minorities. Upper middle socio-economic levels made up 58% of the sample. The sample was demographically similar to Oregon State adolescents.

Students at a school with a SBHC had less unmet need than those without a SBHC (O.R. less than one), but the difference was not statistically significant. Schools with SBHCs had significantly higher proportions of students who reported receiving care for immunisations, sexual health and for personal or emotional problems, than schools without SBHCs.

This large study's limitations include non-random selection of schools, no description of methods used for student selection, no description of pilot testing of the survey questions related to health access, and potential for selection bias as non-attendees on the day of survey were excluded. It is noteworthy that despite large numbers, there was no significant difference in unmet need between students with and without access to a SBHC. This study found students with SBHC access reported greater utilisation of preventive, curative and counselling services.

Kisker and Brown (1996)

Another study, written in two formats, considered access and utilisation of SBHCs as well as health outcomes (Kisker and Brown 1996; Kisker et al. 1994). It is discussed in detail in **Chapter 5**. It was a prospective cross-sectional study with pre-intervention surveys performed on 3,050 students starting at 19 different schools with SBHCs, and repeated three years later. A comparison group of 859 urban youth without SBHC access, was interviewed using a validated telephone survey. An initial survey was carried out among all students with parental consent on school entry with a 57% response rate, while 79% completed the follow-up survey. The study described 3,050 students who had completed both surveys. National urban youth completed the survey through telephone interviewers using a validated method.

Students with access to SBHC at the time of the follow-up survey were aged 17 to 20 years. 32% were African-American, 44% were Hispanic, there were 15% White students and the remainder were of other ethnicities. More than a third of students were eligible for cut-price or free lunches.¹

Results showed that SBHCs clearly increased access to health care. Health centres were used by over 50% of students with access to them. Students most likely to use SBHCs were uninsured, female, older students, and those with chronic health conditions. SBHC students also demonstrated consistently increased health knowledge than national urban youths. SBHCs may have increased overall health care use, and the proportion of adolescents with a usual place of primary health care. A significantly higher percentage of health centre school students visited a health care provider during their senior year than urban youths nationally. 7% more SBHC students reported having a usual place for health care than did urban youths nationally at the time of the follow-up survey. Details are provided in **Table 1 pages 22 - 32**.

This study is limited by lack of a well-matched comparison group. Without this, potential confounding factors mean differences between students with SBHC access, and urban youths nationally cannot be attributed only to the presence of a SBHC. The authors discuss at some length why other methods of comparison were not feasible, but nonetheless, their results are weakened through this approach. The sample selection method had a low response rate (57%) to the initial survey risking a non-respondent bias. The authors analyse this in an Appendix and conclude its contribution is likely to be insignificant. Details of prior validation of the survey instrument and its composition are not given.

Crosby and St Lawrence (2000)

Crosby and St Lawrence (2000), evaluated adolescents' use of SBHCs for reproductive health services using data from a national longitudinal study of adolescent health, including systematic random samples of students in 134 US secondary schools using a validated survey method. Frequency distributions were used to describe which factors predicted use of SBHCs for reproductive health services. Adolescents using SBHCs for reproductive health services were compared with those receiving these services from another source.

The sample (n=20 743) had a wide age range of 12 to 21 years with a mean age of 16.2 years. Students self-identified ethnically (more than one option was allowed) as 23% Black, 62% White, 8% Asian and 4% American-Indian. A fifth of the sample attended a school that provided family planning or counselling services as part of a SBHC. Approximately 6% of students used family planning or counselling services, and also about 6% had used STD related services in the past 12 months.

SBHCs were one of adolescents' least used venues for reproductive health services (13% of family planning service use and 9% of STD services use) by all adolescents in the sample. Using SBHCs for family planning was more common among adolescents who lived in a rural area, did not have a driver's license, were younger and self-identified as Black, Asian, American-India, or Hispanic. For STD related services, SBHCs were preferred by adolescents who were male, Asian, American-Indian, Hispanic or Other race, lived in a rural area, had received a physical exam from a SBHC in the past year and perceived less parental approval of sex.

Limitations to this study include surveying only health provider use over the past 12 months, lack of distinction in responses of those who had used family planning counselling or other services, and the reliability of self-reported behavioural data such as contraceptives use. This study provides insight into which factors predict use of reproductive health services as SBHCs, as well as their contribution to use of reproductive health services by US adolescents.

¹ The National School Lunch Program provides free school lunches to students from families with incomes of up to 133% of the poverty level and reduced-price lunches to those from families with incomes of between 133 and 185% of the poverty level.

Access and utilisation using a comparator population of non-SBHC users within the same school

Seven studies (Adelman et al. 1993; Balassone et al. 1991; Crespo and Shaler 2000; Juszczak 1999; Keyl et al. 1996; Pastore et al. 1998; Walter et al. 1996), compared SBHC users with non-users within the same school. This group as a comparator, has potentially greater demographic similarity than users at another school. Nonetheless, there are also potentially significant confounding factors between users and non-users that are not evident from the demographic profile. For example, students from disadvantaged backgrounds and at high risk for poor health outcomes are also more likely to utilise the free SBHC. This significantly limits the usefulness of this group as a comparator group, and therefore, the usefulness of the results of these studies.

Juszczak (1999)

Juszczak (1999) performed a retrospective cohort study which considered use of health and mental health sites including urgent care, by adolescents across multiple providers in Denver, Colorado.

The sample consisted of three groups of adolescents. Group 1 included students who had access to and did not use a school-based health clinic; Group 2 were adolescents without access to a SBHC (matched for age, sex and socio-economic status with students from Group 1); and Group 3 were students who used their SBHC. Non-SBHC users used a community health network of primary care providers. Users of SBHCs at three schools were followed for three years, and a single clinical coder extracted data from clinical notes in SBHCs and GP offices using ICD-9 coding. The sample of SBHC users was 61% female, 67% Hispanic, 16% Black and 13% White. The mean age was 16.2 years, and the age range was 13 to 22 years.

Results showed significantly greater access and utilisation of primary health care by users of SBHCs than other groups. Users had a mean annual visit rate of 5.3, while non-SBHC users averaged 3.3/year. There was particularly high access and utilisation of mental health services among SBHC users; nearly all mental health visits occurred in SBHCs. Males were 45 times more likely to access mental health services at a SBHC than at a traditional GP clinic.

Positive predictive factors for school clinic use were male gender, Hispanic, older age, not having Medicaid and all behavioural, reproductive, and injury risk factors. After-hours care and emergency department use was four times more likely for youth who had never used a SBHC. Reproductive care and acute care were the most common reasons for seeking care in the group with access to a SBHC who did not use it, and for the control group. Of note, SBHCs in Colorado are not permitted to prescribe or dispense contraceptives.

Limitations to this study include non-randomly selected schools, use of a comparator group with potential confounding effects, and lack of reliability checks in data extraction.

This generally robust study demonstrates significantly increased access and utilisation of youth-targeted health services, particularly in mental health, by adolescents. It shows SBHCs provide access to the most vulnerable groups (higher health risk factors and fewer resources), and reduced use of emergency and after-hour's services by SBHC users in comparison to those using traditional primary care services.

Walter et al. (1996)

Walter et al. (1996), performed a survey using self-reported health risks in a cross-sectional study (evidence grading of III). Four urban junior high schools were surveyed with 1,344 SBHC users and 2,394 SBHC non-users. Each of the schools used an outreach programme to target students with the greatest health risks.

Mean age was 13.5 years with a range of 11 to 15 years. SBHC users were demographically similar to non-users, and the study participants were demographically similar to the whole population with 81% Hispanic and 10% Black students.

Results showed clinic users were significantly more likely to be sexually active, to not use contraception, to have greater risk of suicide behaviours, greater exposure to violence and the drug culture, and to have failed subjects at school.

Limitations in study design include self-reporting of health behaviours, cross-sectional design and use of a comparator group that may not be comparable to the sample. The investigation suggested that school health clinics are used by the most vulnerable members of school populations and potentially reduce their health risk behaviours.

Balassone et al. (1991)

A further study by Balassone et al. (1991) considered users and non-users of a SBHC within a high school one year after the health centre opening. It used a cross-sectional survey design. The survey tool was a written questionnaire without details provided on validation, piloting or reading level. The target population was the entire school population. On survey day, approximately 24% of the 813 students were absent, although the survey was completed by almost all other students. Validation of numbers of users and non-users of the SBHC was performed using clinic records and school registration data.

The age range of students in the sample was 14 to 18 years. Ethnically, approximately one-third of the population was Asian, one-third was Black, one-third was White, and one-third of the students eligible for reduced-price school lunches.

Results of the questionnaire showed that clinic users were more likely to be at high risk for drug or alcohol abuse, and to report higher life stressors. Users of the school health centre were also more likely than non-users to report receiving care when they had a health or mental health problem, and had significantly greater knowledge than non-clinic users about where to get health care when required. Reasons cited by non-users of the clinic for non-use were lack of need for service (70%), had not returned parent consent form (35%), or did not know about the clinic (8%).

Sample selection is a limitation to this study. It is likely that absentees differ systematically from students present at school introducing selection bias. The survey relied on self-report by students, and follow-up time was short. Results may be different with increased time for student exposure. This study suggests youth-targeted primary care services based at a school provide greater access and utilisation of health services. It also shows the school clinic population as higher risk for health behaviours and with greater home stressors – suggesting that the clinic is providing care to the most needy sector of the school population.

Adelman et al. (1993)

Adelman et al. (1993), studied SBHC utilisation, and reasons for use and non-use. His study used a cross-sectional method of 471 students at one high school. The survey tool adapted and combined previously validated questionnaires. The age range was 16 to 20 years with an average age of 17.7 years. Ethnically, 90% were Hispanic. Socio-economically, 65% came from lower or lower middle-class backgrounds. Demographically, there were no differences between clinic users and non-users.

Over 80% of enrolled students had made one to five visits, and 14% made over six clinic visits. Half of users used the clinic for illness, 18% for contraceptives, and nearly one-third used the clinic for counselling. Ninety percent of users were satisfied with clinic services.

Reasons for clinic use (in descending order of importance) were: easy access, care was helpful, clinic staff trustworthy, visits confidential, good opening hours and cheap. Reasons for non-use of the clinic (in descending order of importance) were: healthy, don't want others to know, staff won't be helpful, and too embarrassed. Those who reported using the clinic most frequently had the highest scores on measures of psychological distress and psychosocial problems.

Limitations to this study include no evidence of piloting questionnaires, poor sample selection (use of volunteers), unknown reliability with self-reporting, use of a comparator (non-users) that may differ from the sample in ways not obvious by comparing demographics. Overall, this study provides some

evidence that a SBHC provides increased access to mental and physical health care for students whom otherwise may not seek help. It identifies the most frequent users as those with the greatest stressors and psychosocial problems – suggesting that it is providing health care to those who need it most.

Crespo and Shaler (2000)

Crespo and Shaler (2000), reviewed the computerised clinic records of 10 SBHCs in 13 middle and high schools over three academic years. This was a cross-sectional study. There were 12,282 students enrolled in the SBHCs, and 8,104 of these were SBHC users.

At the third year of operation, two-thirds of the student body were enrolled with the SBHCs and 57% of these used the centres. Students who were uninsured, or with Medicaid, had a significantly higher mean number of visits per year. Enrolment in rural schools was 86% compared to 46% in urban schools ($p < 0.001$), and utilisation was also higher in rural schools.

Limitations of this study include lack of demographic data on the student populations, reducing generalisability of the findings, and no description of methods for data extraction. Use of clinical records for indications of utilisation is likely to be unbiased.

This descriptive study provides some evidence that youth-targeted primary care in the form of a SBHC, provides increased access to the most needy groups of youth – in this case, identified as those without health insurance and on Medicaid. It also suggests that SBHCs are an acceptable and effective form of primary care for rural youth.

Keyl et al. (1996)

Keyl et al. (1996), performed a cross-sectional survey of 280 African-American students identified by random sampling (age range 11 to 19 years). The survey was administered face-to-face with a response rate of 84%. Self-reporting of students' enrolment and utilisation was verified by clinic statistics. There were 64% of students enrolled in the SBHC, and 75% of these had used it in the past 12 months. Major perceived barriers were difficulty in obtaining a teacher's permission to leave class to use the health centre (55%), and the need for parental consent to enrol (31%). Students reported being more likely to use the SBHC than a GP for primary care if they had Medicaid insurance.

External validity is reduced in this study as the entire sample is African-American and from a lower socio-economic group. This study suggests that socio-economically deprived students are likely to utilise a SBHC.

Pastore et al. (1998)

Pastore et al. (1998), performed a survey (cross-sectional study) in an urban high school, two years after a SBHC had been in place. The validated written survey tool considered and compared mental health problems among SBHC users and non-users.

The 630 participants were demographically representative of the 1,500 students in the school, and had a mean age of 16 years. Ethnically, 61% were Black, 30% Hispanic and the remainder White and Asian.

Sixty percent of the sample students were registered in the SBHC. Significantly more females than males were likely to be frequent users (>3 visits/year). Frequent users, average users and non-users of the SBHC did not differ by age, grade, race or any of the measured mental health problems. In clinic users, the health centre was used for mental health services by 34%, and for sexuality related care by 15%. Ninety-two percent of clinic users were satisfied with health care services offered. Reasons reported for not using the SBHC were reported (in descending orders of frequency) as:

- already had a physician
- did not need it
- prefer continuing with previous primary health care source
- parents were opposed
- confidentiality concerns, unaware of clinic services.

Limitations of the study method include methods of participant selection (absentees or those who did not do physical education classes were excluded). While no evidence is given to support the authors' statement that the sample is demographically similar to the whole school population, it is reassuring that nearly half the school participated ($n > 600$). Other limitations include self-reporting (unknown reliability), as well as a cross-sectional design (cannot assign cause and effect relationships).

The findings of this study differ to others which consider utilisation patterns between users and non-users such as Balassone et al. (1991); Walter et al. (1996); Zimmer-Gembeck et al. (1997) and Adelman et al. (1993). Each of these studies found differences between users and non-users of SBHCs, which were not found in this study. Possible reasons for this include premature evaluation (this school's SBHC was only two years old), a lower percentage enrolment and utilisation in the other centres, and other SBHCs have specific outreach programmes for the most at-risk population.

DISCUSSION

Impact on access and utilisation

These studies consider the impact of a youth-specific primary care service on access and utilisation for youth. Of the 11 studies that compared the SBHC users with youth who do not use a SBHC for primary care, seven reported directly on differential utilisation of the health care provider for medical services. Six of these (Anglin et al. 1996; Balassone et al. 1991; Juszczak 1999; Kaplan et al. 1998; Keyl et al. 1996; Zimmer-Gembeck et al. 1997) demonstrated increased utilisation of primary care services (higher mean annual visit rate is the usual measure used) among youth with access to a SBHC. A seventh study showed increased use of SBHCs (versus accessing traditional primary care) by uninsured users (Kisker and Brown 1996). The studies provide strong evidence supporting greater access and use of youth-targeted primary health care by adolescents with access to these services.

Studies using a comparator group are methodologically more robust. Of importance, the studies with more rigorous methodology such as Juszczak (1999) and Kaplan et al. (1998) show the most compelling results. Kaplan et al. (1998), demonstrated that students with access to a SBHC, visit mental health and substance abuse services within primary care 10 times more than youth without SBHC access. Juszczak (1999), also reported a significantly higher mean annual visit rate among SBHC users (5.3/year where GP clinic users average 3.3 visits/year).

The enhanced health care access and utilisation among youth with access to a SBHC is not limited to adolescents. Kaplan et al. (1999) used a retrospective cohort analysis to study primary school students with SBHC access, and a comparison group at a primary school without a SBHC. Parents with children with access to a SBHC reported significantly less difficulty receiving physical health care for their children, significantly less emergency department use, and a greater likelihood of a recent physician's and dental visit.

Other studies have considered access to health care for adolescents more generally and within the framework of traditional primary care providers (Klein et al. 1999; Murdoch and Silva 1996). Factors associated with access to care described by Klein et al. (1999) show that 27% of 6,748 adolescents surveyed had missed needed care. Reasons for missed care included cost, no health insurance, and not wanting parents to know. Groups with less access were older adolescents, ethnic minorities and the uninsured.

Utilisation of health care services often acts as a proxy for access. For example, a utilisation study performed in New Zealand examined use of general practice services by 18 year olds (Murdoch and Silva 1996). This represented access to services for participants.

Demographics of SBHC use and access

The majority of the studies described enhanced access and utilisation of youth-targeted primary care services by young people who were typically more vulnerable, or who had greater health needs such as special needs students.

Gender

Seven studies described increased use of SBHC services by females in this age group (Balassone et al. 1991; Brindis 1995; Chavasse et al. 1995; Crosby and St Lawrence 2000; Geddes 1997; Kisker and Brown 1996; Pastore et al. 1998). Only one study found male gender a positive predictor of SBHC use (Juszczak 1999). This finding of increased SBHC utilisation by females is consistent with greater overall health care utilisation by females in this age group generally (Brindis et al. 1995).

Age

Three studies described increased use of the service by older teenagers and young people (Brindis et al. 1995; Geddes 1997; Juszczak 1999). This also may reflect greater health needs – e.g. a higher proportion requiring contraceptive advice.

Ethnicity

Results varied on the impact of youth-targeted primary care on utilisation by different ethnic groups. Some studies report increased use by Hispanic and African-Americans students proportionate to the school population (Crosby and St Lawrence 2000; Santelli et al. 1996b). A New Zealand study found significantly greater school clinic use by Maori and European students, and significantly less by Asian and Indian students (Chavasse et al. 1995).

Other studies have reported no significant differences in ethnicity between clinic users and non-users (Adelman et al. 1993; Anglin et al. 1996; Juszczak 1999; Pastore et al. 1998). Another author reported increased use by White/European students relative to the school population (Brindis et al. 1995). This study also reported reduced utilisation by Pacific Island/Asian populations, and described these ethnic groups as less likely to be SBHC users. This may be due to differing levels of acculturation (Brindis et al. 1995).

It may be that individual youth-targeted primary care services have differing degrees of ethnic-specific appropriateness and acceptability producing the conflicting results above.

Socio-economic status

Most of the studies considering access and utilisation used surveys and self-reporting by participants. A variety of proxy measures are used by researchers to provide some indication of clinic users' socio-economic status such as the percentage of students eligible for reduced-price free lunches, level of education of the student's mother, or health insurance status for US studies. SBHCs in the US generally are free to students, although insurance companies are invoiced for students with health insurance. While New Zealand clearly has a very different context, with private health insurance uncommon, it is useful to consider whether school-based or youth-targeted primary care services elsewhere have improved access for less advantaged populations.

A number of studies described increased utilisation by students who are more deprived (e.g. uninsured, on Medicaid, mother has not completed secondary schooling) (Crespo and Shaler 2000; Juszczak 1999; Kisker and Brown 1996; Kisker et al. 1994). Keyl et al. (1996), also describes students with Medicaid as significantly more likely to use the SBHC than GP. However, Brindis et al. (1995) found no difference in use of SBHC medical services by insurance group, but found significantly higher use of mental health services by students with Medicaid insurance, and reported that SBHC utilisation (all services) is higher among students with private or HMO health insurance.

Overall, the evidence supports increased access and use of youth-targeted primary health care services for young people who are socio-economically less advantaged.

High risk youth

Youth-targeted health services hope to enhance access and utilisation of primary care services by youth who most need them. By comparing health risk behaviours and psychosocial stressors of youth with access to a SBHC, with youth who do not have SBHC access (i.e. who use traditional primary care), it

is possible to evaluate the accessibility of SBHCs for high risk youth. Seven studies specifically consider the impact of SBHCs on high-risk youth.

Walter et al. (1996), demonstrated that clinic users in his study were significantly more likely to have engaged in high risk health behaviours, as well as to have been exposed to violence and the drug culture. This was also seen in the studies which showed that more frequent clinic users had a higher health risk profile (e.g. use of drugs, drink driving), as well as a significantly higher mean measure of life stressors (Adelman et al. 1993; Balassone et al. 1991; Juszczak 1999). This evidence supports SBHCs as providing greater access to health services for youth most at-risk. That SBHCs are meeting these needs is supported by Zimmer-Gembeck et al. (1997) who reported highest levels of unmet needs for drugs and alcohol, and personal problems in schools that did not have a SBHC.

Other studies described no differences between clinic users. Pastore et al. (1998), found similar levels of clinic use by self-reported mental health status of students, and Kisker and Brown (1996) reported no difference in health risk behaviours between students with, or without, SBHC access.

Overall, evidence supports enhanced access and use of youth-targeted primary care services by at-risk youth.

Special Needs

Santelli et al. (1996b), described special education classes as a factor predictive of enrolment in a school-based clinic.

Rural

Two studies considered the impact of youth-targeted primary care to rural youth. Crespo and Shaler (2000), reported significantly greater enrolment as well as more frequent utilisation in rural versus urban schools. Crosby and St Lawrence (2000), described significantly increased use of a SBHC for reproductive/sexual health services, by youth who live in a rural area compared to urban youth. Overall, research evidence supports enhanced access and use of youth-targeted primary care by rural young people compared to urban youth.

Barriers to access

Many of the studies appraised here considered why young people do not access school-based primary care. Reported reasons for non-use of a SBHC included non-return of parental consent form, already had a doctor, parents opposed to SBHCs, concerns about confidentiality, did not need the clinic, did not know about the clinic, did not consider staff would be helpful, needed teacher's permission to leave class and health centre hours. As services were provided free, cost was not a barrier to access.

Some of these are specific to a school-based service (e.g. needing teacher's permission to leave class), while others reflect concerns youth have generally about primary care. Recurrent themes were also found in research in New Zealand (Chavasse et al. 1995; Geddes 1997), see **Chapter 7**. As with all self-reported data, the reliability and validity of these responses is not known.

Factors increasing access

It is also useful to consider what factors youth identify as improving access. Reasons for use of a SBHC identified in the study by Adelman et al. (1993) included easy physical access, helpful care, trustworthy staff, confidential visits, good opening hours and cheap or free. Additional factors raised by New Zealand youth included friendly staff, comfortable atmosphere, youth oriented and convenient (Chavasse et al. 1995; Geddes 1997). Other factors predictive of SBHC use in the US included use by peers, membership of a club or team (Santelli et al. 1996b) and previous use (Balassone et al. 1991; Crosby and St Lawrence 2000). It is possible those who are part of a club or team have greater social capital (in terms of networks and cohesion of a group), which in turn, increases their ability to identify and use appropriate health services.

Impact of SBHCs on access and utilisation of mental health services

Eight studies that fit the inclusion criteria for this review discuss the impact that youth-targeted health care services have on mental health (Anglin et al. 1996; Jepson et al. 1998; Juszczak 1999; Kaplan et al. 1998; Kisker and Brown 1996; Pastore et al. 1998; Walter et al. 1996; Zimmer-Gembeck et al. 1997). These consider both access and utilisation of mental health services, as well as self-reported mental health status as a result of these services.

Juszczak (1999), found that mental health service visits as a proportion of total consultations were six times more common among those with SBHC access. She also showed that males with access to a SBHC were 45 times more likely to access mental health services than those with traditional primary care. The study reported that 97% of all mental health visits among the study populations occurred in a SBHC. Kaplan et al. (1998), reported similar results, and found mental health visits were 10 times higher in students with SBHC access, and that 97% of all mental health consultations occurred in schools. This was even more notable in substance abuse related consultations – none occurred outside a SBHC. This evidence strongly supports increased access to mental health services through a youth-targeted primary health service such as a SBHC.

Other studies verify the enhanced access provided by SBHCs by showing higher utilisation of SBHCs by students who self-report mental health risk behaviours and problems. Walter et al. (1996), found clinic users significantly more likely than non-users to report suicide intentions or attempts, as well as exposure to the drug culture. Jepson et al. (1998), reviewed mental health related clinical records in one SBHC, and found that mental health consultations made up over one-fifth of all consultations. Anglin et al. (1996), describes 25% of SBHC users having made a mental health related consultation. The study by Zimmer-Gembeck et al. (1997), provided evidence supporting youth-targeted services fulfilling a perceived need for mental health services. The authors describe significantly greater unmet needs for drugs and alcohol problems, as well as personal problems for youth at schools without a SBHC.

While it seems clear that youth-targeted primary care services can increase access to, and utilisation of mental health services, evidence demonstrating improved mental health status among students with access to these services is lacking. Pastore et al. (1998), measures self-reported mental health of SBHC users versus non-users within a New York high school. This study found no statistical difference in frequency of use of the SBHC related to self-reported mental health variables. Kisker and Brown (1996), similarly described no difference in self-reported mental health status between students with or without SBHC access. As mentioned elsewhere, there are significant concerns about the comparator groups used in both these studies which limits the quality of their evidence.

Summary

The studies of access and utilisation provide research evidence that there is improved access and utilisation of primary care services that are youth-targeted as opposed to traditional primary care services. This improved access and use is seen generally, although is particularly evident, in more vulnerable groups such as the socio-economically less advantaged, as well as youth that are at higher risk psycho-socially. Factors that enhance access and utilisation, as well as barriers to access, have been identified. These may be useful in informing the development of SBHCs in New Zealand.

Summarising the effect of youth-specific primary care on mental health, there is clear evidence demonstrating significantly increased access and utilisation of mental health services, in comparison to more traditional forms of primary care. There is currently insufficient evidence to support comprehensive youth-targeted primary care resulting in improved mental health status.

Table 1. The impact of youth-targeted primary care on access and utilisation

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Brindis et al. 1995) USA	Cross-sectional study Comparator group non-users in same school Level III	A study of the impact of health insurance status on utilisation of SBHCs at 3 urban high schools in northern California. Target population – all students Response rate 66% Participants n =2860	Age range 14-18 years Ethnicity Hispanic 48% Black 21% Pacific/Asian 16% White 8% Other 7% Gender Male 49% Health insurance None 42% HMO 25% Medicaid 19% Private 14%	SBHC users more likely to be White, female, depressed, older than 16 years. SBHC users less likely to be Asian or Pacific Islanders. Reasons for SBHC use trust it (37%) Easy to get to (36%), helpful (31%) and cheap (9%). SBHC Utilisation by health insurance Private 67% Significance p<0.01 HMO 66% Significance p<0.01 Medicaid 59% None 57% No difference in use of medical services by insurance group. Medicaid significantly higher user of Mental Health services p<0.05	Limitations <ul style="list-style-type: none"> there is no comparator group without access to a SBHC methods of participant recruitment/sample selection are not given (although it seems whole school populations target) reduced external validity (Ethnic composition and three schools all urban in one region). Overall This is a methodologically sound study that provides insight on impact of health insurance status on SBHC utilisation and general demographic factors predictive of SBHC use.
(Jepson et al. 1998) USA	Cross-sectional study Level III	Review of mental health related clinical records in one SBHC. Timing Calendar year -1992 Location High school in New York Total students N=265 Total mental health visits N=1002 Data extraction from clinical records (primary diagnosis) in each visit.	Age 9 th – 12 th grade (Majority 16-18 years) Ethnicity Black 72% Hispanic 21% Other 7% Socio-economic status Not described.	95% of students self-presented 5% referred from medical services Mental health consultations N= 1002 Total SBHC consultations N= 4852 Mean visit rate 4/year Primary diagnoses – Mental health Pregnancy/Sexuality 27% Depression/Suicidal ideation 22% Conflict/Violence 22% Drugs and Alcohol 6%	Limitations <ul style="list-style-type: none"> external validity – one school in urban USA, over one year descriptive study – no comparison group, non-random selection of one school. Overall This study demonstrates high rates of use of mental health services within a SBHC and types of diagnoses that are made. Access to mental health services is maximised when services and site are shared with primary care.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Chavasse et al. 1995) NZ	Cross-sectional No comparator group Level III	Utilisation of a school doctor clinic in a NZ secondary school – described in 3 ways: 1. Written health status survey of students n=221 (22% of the school population). Survey previously validated and sample selection by random number selection of classes. Response rate 75%. 2. Diagnostic coding summary (224 consultations and 346 diagnoses over 3 months). 3. Client satisfaction survey (n=108) Voluntary participation. Response rate 76%.	Age range 13-19 years Ethnicity (survey/school) European 51% Indian/Asian 27% Maori 9% Pacific 8% Of Clinic Users Significantly more Maori and European, females and significantly fewer Indian/Asian than school population.	Had seen no other provider with this problem 69% Clinic survey Clinic 'good' idea 95% (because no cost, easy to access and confidential) Written health status survey Self rating of health Excellent/good 84% Visit to GP in past 12 mths <67% Diagnosis Skin 22% Respiratory 16% Musculo-skeletal 14% Contraception/Preg 8% Sexual health 6%	Limitations The short duration of study (3 months) masks true utilisation rates. No description of piloting of surveys after adaptation from previously validated questionnaires, no comparator group and self-reporting of student's health status (unknown reliability). There is reduced external validity to other New Zealand settings given the lower proportion of Europeans and higher proportions of Indian/Asians than the general population. Comment A study with appropriate design. It demonstrates significant uptake of a school-based primary care service in New Zealand with greater utilisation by Maori, European and females than others.
(Geddes 1997) NZ	Cross-sectional No comparator group Level III with qualitative component	A validated and piloted written survey of client satisfaction with a specific youth-targeted primary care service in central Christchurch using closed and open-ended questions. There is description of appropriate methods of representative participant recruitment, data extraction and analysis (thematic analysis of responses to open-ended questions). Respondents n=115 Response rate = 93%	Age Range 15-25 years 94% Ethnicity European 79% Maori 17% Other 4% Gender Female 70.5% The sample is demographically very similar to youth health centre clientele.	Reasons for using this service No cost 77% Friendly staff 21% Comfortable atmosphere 12% Convenient 9% Youth oriented 8% If this service were unavailable Other primary care provider 61% Would not go anywhere 30% Don't know 8% Results are credible, including sequences of the original data. This youth health service as accessible, acceptable and appropriate. Some dissatisfaction expressed with opening hours and appointment-making procedures.	Limitations • no description of position of author • no comparator group is surveyed describing their views on their primary care service provision, which would have significantly strengthened the study's findings • sources of qualitative data cannot be determined • no independent thematic analysis. Comment Overall, this study uses appropriate methods and provides evidence of a high level of client satisfaction with a youth-specific primary care service in urban New Zealand.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Kaplan et al. 1998) USA	Retrospective cohort Comparator group matched without SBHC access Level II-2	Study of utilisation of health services by insured (Kaiser Permanente Colorado) teenagers with access to a SBHC (N=240) compared to matched insured (KPC) teenagers without SBHC access (N = 116). Sample selection by matching SBHC database with KPC database. Consultation information extracted from ICD coding (SBHCs) and medical notes. Total visits N=3394.	Age range 14-18 years Ethnicity Not provided. Socio-economic status Participants and controls matched but details are not given. Insurance status Participants and controls all in managed care with a managed care insurance scheme (KPC).	Mental health (MH) visits Access to SBHC N= 303 No access to SBHC N= 11 I.e.10 times higher in SBHC students and 96.5% of all MH consultations occurred in schools. No substance abuse visits out of SBHCs. Use of after-hours care SBHC reduced use by 33 -55% Preventive care 80.2% with SBHC 68.8% without SBHC (p<0.04) Diagnosis SBHCs saw fewer "accident" type presentations and more gynaecological visits.	Limitations Participants were all insured students with KPC – this reduces generalisability of findings to teenagers who are not insured or who have a different health insurance plan. Lack of description of the ethnicity and socio-economic profiles of participants reduces external validity of the findings. Overall This robust study provides evidence of increased access and utilisation of primary health care services through school-based health clinics. This is particularly apparent in the mental health and substance abuse areas. It supports reduced need for after hours care and increased preventive care with youth-targeted comprehensive primary care.
(Santelli et al. 1996b) USA	Cross-sectional with comparator of non-users and schools without SBHC Level III	A survey of student attitudes towards SBHCs. 9 schools with SBHCs 4 comparison schools without SBHCs SBHC enrolees compared with • non-enrolees • those at a non-SBHC school. Survey tool Previously validated questionnaire with some novel questions. Sample selection School principals asked to select representative classroom sample 7% of questionnaires excluded from analysis.	Mean age SBHC schools 14.8y Non-SBHC 14.4y Ethnicity SBHC schools Black 75% White 21% Non-SBHC schools Black 61% White 31% SBHC enrolees Black special education have Medicaid	Student attitudes to SBHC • high overall support for SBHC with greater support from users of SBHCs • less use and support of counselling services by enrollees • greater support for family planning services from enrollees • high overall level of satisfaction and belief in SBHC privacy – greater among enrollees. Predictors of enrolment Membership of club or team, peer use of SBHC, special education classes and African-American students.	Limitations • self-reporting on SBHC use • schools all within one city – reduced external validity • classroom sampling not randomised • comparison schools not strictly comparable. Comment This study provides evidence of student attitudes and greater support for SBHCs by those with most direct knowledge. This increased with greater use of SBHCs (i.e.enrolees). It demonstrates increased access to health care through SBHCs for the most vulnerable sectors of the adolescent population.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Anglin et al. 1996) USA	Retrospective cross-sectional study Comparator group national data of primary care use Level III	Retrospective case notes review (computer records) of SBHCs with comparison to national data of traditional primary care providers Reviews 3 SBHCs over 4 academic years (1988 – 1992). N=3818 students who have used SBHC (42% of total student population). N= 27 886 Number of consultations.	SBHC users sample Age at initial visit 14 –19 years Gender Female 53% Ethnicity Black 22% White 44% Hispanic 28% Other 6% Note – No significant difference between SBHCs users vs non-users at schools.	Consultation type Medical 94% of users Mental Health 25% of users Substance Abuse 8% of users Mean number annual visits Medical 3.3 (National 2.3) Mental health 5.8 Substance abuse 6.8 Mean duration of visits Medical 21 minutes (National average 10 minutes) Preventive care 48 minutes Mental Health 47 minutes Substance abuse 45 minutes	Limitations <ul style="list-style-type: none"> no validation of computer diagnosis code accuracy insufficient information to duplicate study reduced external validity (3 schools in same area) comparison of utilisation and services with national data is limited. (National data not available for mental health/substance abuse). A retrospective case review of matched controls using office-based care as a comparator would make a much stronger study. Comment A reasonable quality study giving evidence for both greater utilisation of health services through a SBHC as well as potentially better quality services.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Zimmer-Gembeck et al. 1997) USA	Cross-sectional survey Comparator group youth without SBHC access Level III	A survey of adolescents' reported need and use of health services using a written survey (national Youth Risk Behaviour Surveillance Survey with access related add-ons) evaluating health care utilisation and unmet health care needs among adolescents at 50 Oregon high schools. 50 'volunteer' high schools n=14981 students completed survey (80% participation) n=13 992 surveys analysed 32% of participants had access to SBHCs	M=F Ethnicity White 81% Black 2% Age range 14 - 18 yrs Socio-economic status Upper-middle 58% Demographical make-up similar to Oregon state adolescents.	80% had visited a doctor or NP in past 12 months. Multivariate logistic regression examining visit to Dr in past 24 months (brackets are 95% C.I.'s) Males OR= 1.33 (1.16-1.53) Asian/Pacific Islander OR= 2.38 (1.83-3.08) Hispanic OR= 1.85 (1.41-2.44) Other ethnicity OR= 1.51 (1.05-2.17) Low SES OR= 1.35 (1.17-1.55) Rural OR= 1.31 (1.12-1.53) (Note – OR>1.0 indicates reduced Dr visits) Multivariate logistic regression examining self-reported unmet health needs Males OR=0.9 (0.82-0.99) Lower grades OR=0.92 (0.88-0.96) Asian/Pacific Islander OR=1.28 (1.03-1.59) Sexually active OR=1.92 (1.74-2.11) Rural schools OR=1.16 (1.05-1.29) Unmet needs for sexual health as well as drugs and alcohol and personal problems significantly greater in schools without SBHC.	Limitations <ul style="list-style-type: none"> schools not randomly chosen and method of student selection within schools not described school non-attendees on survey day excluded (selection bias) self-reporting of health needs by adolescents no pilot testing of health access questions added onto trialled YRBS survey. Overall This study has large numbers and generally appropriate design. It has important results describing demography of those with less utilisation of medical services and with greater unmet health needs. It identifies greater unmet needs at schools without SBHCs.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Kisker and Brown 1996; Kisker et al. 1994) USA	Prospective Cross-section (initial and follow-up surveys) with national comparator group Level III	An evaluation of impact of SBHCs in 19 schools over three years. N= 3050 students with access to SBHC Target population (Initial survey) all students at entry level to high school (9 th and 10 th grades) Response rate 57% (Initial) 79% (Follow-up) N= 859 urban youths without access to SBHC (9 th and 10 th grades) Response rate 75% (Initial) 87% (Follow-up)	Age range (follow-up) 17-20 years Students with SBHC Male 44% African-American 32% Hispanic 44% White 15% Other 9% Low SES 44% National urban youth 50% 28% 20% 45% 8% 29%	Access and Utilisation Over 50% of SBHC students used SBHC Significantly higher utilisation by uninsured, chronic illness, female students and older students. Health knowledge SBHC students showed greater health knowledge. Health risk behaviour No difference in contraceptive use, sexual activity, smoking, alcohol and substance use, marijuana use. Health status No difference in self-reported physical and mental health status or pregnancy rates between students with or without SBHC access. Emergency dept use No significant difference in use between students with or without SBHC access.	Limitations <ul style="list-style-type: none"> poorly matched comparison group – risk of confounding factors for observed differences between students with access to SBHC and national urban youth controls no description of survey instruments' validation or content low response rates to initial survey – risk of non-respondent bias –authors analyse this and considered non-contributory. Comments This study could have more conclusive and better results with a well-matched comparison group. Overall This study suggests SBHCs enhance health care access, utilisation and knowledge but do not alter risk behaviours or health status.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Crosby and St Lawrence 2000) USA	Cross-sectional with comparator of national sample Level III	A large national survey, part of a larger study, evaluating use of reproductive health services within SBHCs. Sample selection Systematic random samples from 134 secondary schools. Number of participants N=20 743 Sample size is adequate. % of sample with access to school based reproductive health services 20% Response rate not given here. Survey previously validated and piloted.	Age range 12-21yrs Mean age 16.2yrs Ethnicity White 62% Black 23% Asian 8% American-Indian 4% Other 10%	Use of family planning 6% Use of STD services 6% Factors predicting SBHC use for family planning Females Live in rural area No driver's license Younger Black, Asian, American-Indian, Hispanic Factors predicting SBHC use for STD services Male Asian, American-Indian, Hispanic, Other Live in rural area. Had received physical exam from SBHC in past year. Total Contribution SBHCs -Reproductive health service use (adolescents) 13.3% family planning 8.9% STD services	Limitations <ul style="list-style-type: none"> ▪ self-reported data (unknown reliability) ▪ no distinction between family planning counselling and dispensing of contraceptives ▪ short timeframe (service use in past 12 months). Comment Overall a robust study providing insight into factors predicting utilisation of reproductive health services within SBHCs.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Juszczak 1999) USA	Retrospective cohort using clinical records Comparator groups non-users in same schools as well as youth without SBHC access Level II-2	A study evaluating use of medical and mental health service across different providers. Sample Group 1 access to SBHC and do not use N=240 Group 2 no access to SBHC N = 459 Group 3 access to SBHC and use N=213 N= 582 adolescents with N= 4569 total consultations (SBHCs and Clinics) Study period 1990 - 1992 (3 years) Data extraction Single clinical coder reviewing patient notes at SBHCs and Primary Care clinics using ICD 9.	Gender Male 39% Age (years) Mean 16.2 y Range 13 - 22 Ethnicity (Clinic users) Hispanic 67% Black 16% White 13% Insurance Status Medicaid 24% Ability to pay 70%	Mean annual visit rate (p<0.01) SBHC users 5.3 GP clinic users 3.3 Mental health services/visits SBHC users 26% GP clinic users 4% Note 97% of all mental health visits occurred in SBHCs Positive Predictors of SBHC use Male No Medicaid Behavioural RFs Age 18-22 Reproductive RFs Injury RFs Use of emergency department/urgent care More likely for youth who had never used a SBHC OR=4.34 (95% CI 3.44-5.47)	Limitations <ul style="list-style-type: none"> data extraction method lacks validation/ repeatability checks schools non-randomly selected reducing external validity. Overall This is a robust study with compelling evidence to support increased access and utilisation of primary and mental health services within youth-targeted care. Mental health is accessed eight times more frequently at SBHCs. Use of SBHC also reduces emergency and urgent care service utilisation relative to non-users. SBHCs provide access to the more needy adolescents with the greatest health risk factors
(Walter et al. 1996) USA	Cross-sectional – comparator of non-SBHC users in same schools Level III	A self reported health risks survey of SBHC users vs. non-users in 4 urban junior high schools. Eligible population n=5747 Participants n =3738 SBHC users n=1344 SBHC nonuser n=2394 Survey instrument based on previously validated surveys.	Age range 11-15 yrs Mean age 13.5 years Ethnicity Hispanic 81% Black 10%	Clinic users significantly more likely to: <ul style="list-style-type: none"> be sexually active not use contraception suicide intention or attempt exposure to violence exposure to drug culture have failed subjects at school. 	Limitations <ul style="list-style-type: none"> self-reporting cross-sectional study – cannot extract cause and effect use of non-users in same school has potential confounding effects. Overall This study demonstrates that students accessing the SBHC are those with greatest health needs, more health risking behaviours and most vulnerable psychosocially.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Balassone et al. 1991) USA	Cross-sectional study Comparator group non-users in same school Level III	Comparison of users vs non-users of SBHC in one school in Washington state one year after opening of SBHC. Target population n=813 (all of school) Response rate 75% N=614 Survey tool written questionnaire	Age range 14-18 years Ethnicity Black 30% White 30% Asian 40% Eligible for reduced-price lunches 30%	Users of SBHC had higher health risk profile (use of drugs, drink driving etc.) Mean measure of life stressors (p<0.01) Users 1.95 Non-users 1.25 Access and utilisation Users of SBHC reported significantly increased knowledge of where to get health care and of receiving health care. Reasons for non-use of clinic Did not need service 70% Not returned consent form 35% Did not know about clinic 8%	Limitations <ul style="list-style-type: none"> no description of validation/piloting of questionnaire 24% of school absent on survey day (potentially different population to attendees) self-reporting has unknown reliability short follow-up time (<1 year) from start of SBHC only one school surveyed = reduced external validity. Overall This study uses adequate design and methodology with evidence that users of the SBHC are those who most need it with higher health risk and life stressors. Clinic users show increased access and utilisation of health services to non-clinic users.
(Adelman et al. 1993) USA	Cross-sectional study Level III	A comparison of clinic users vs non-users in a volunteer sample of 12 th Grade students in one school in California. Participants N=471 Survey tool 134 item written questionnaire (previously validated)	Age range 16 - 20 years Mean age 17.7 years Ethnicity Hispanic 90% Black 3% Other 7% Socio-economic status 65% lower or lower-middle-class background	Clinic users – reason for visit Illness 49% Contraceptive supplies 18% Counselling 28% Satisfied with service 90% Users vs. non-users No demographic differences (note =fairly homogeneous 12 th grade population) Most frequent users had highest scores: psychological distress psycho-social problems. Reasons for clinic use Easy access, helpful care, trustworthy staff, confidential visits, good opening hours, cheap. Reasons for clinic non-use Healthy so don't need it, don't want others to know, staff won't be helpful.	Limitations <ul style="list-style-type: none"> no evidence of piloting of adapted questionnaires sample selection with volunteers self-reporting = unknown reliability reduced external validity – only one school. Overall This study provides evidence that a SBHC provides increased access to mental and physical health care. Most frequent clinic users have highest stressors and psychological distress suggesting those with greatest need are accessing health care. Reasons for clinic use and non-use are described.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Crespo and Shaler 2000) USA	Cross-sectional (review of patient records) Comparator group non-users within same schools Level III	Review of computerised clinical records in 10 SBHCs based in 13 high and middle schools (3 urban and 7 rural health centres) over 3 years (7/94 – 6/97). Total students enrolled N=12282 Of these, students using the SBHC N= 8104 Note – none of the SBHCs provided reproductive health services. Assessment of SBHC access and utilisation in a rural context.	Age not given – likely age range 12 – 19 years Ethnicity not given Insurance status Medicaid 23% Uninsured 28% Private 43% Unknown 6%	Enrolment and utilisation rates At 3 rd year of operation 64% of students were enrolled and of these 57% of these used the SBHC. Mean visits/yr Uninsured or Medicaid 3.2 Private insurance 2.6 (p<0.001) Rural schools 3.2 Urban schools 1.8 (p<0.001) Enrolment levels Rural schools 86% Urban schools 46% (p<0.001)	Limitations Basic demographic data about the students in this study is not provided reducing external validity. Validation and description of methods of data extraction are not given. Subject selection was unlikely to be biased as all clinical records at the 10 schools were examined. Comments Overall this study provides some evidence that SBHCs increased access to health care to those who most need it – including youth who are uninsured or on Medicaid. It suggests improved access and utilisation of health services in rural areas through SBHCs.
(Keyl et al. 1996) USA	Cross-sectional study Comparator group non-users in same school Level III	A survey of students access, knowledge and use of SBHC services in 2 urban schools in Baltimore, USA. Participants n = 280 (users and non-users) Sample selection Random sampling Questionnaire (pre-tested) examining students knowledge, barriers to access and use of services at two SBHCs.	Age range 11-19 yrs Ethnicity 100% African-American students Gender 42% male	Knowledge about SBHC High knowledge about SBHC functioning Greater knowledge with greater use. Primary barriers to access (descending importance) ▪ teachers permission to leave class ▪ need for parental consent ▪ health centre hours ▪ confidentiality concerns. Utilisation 64% of students enrolled 75% had used in past 12 months More likely to use SBHC than GP if enrolled and if have Medicaid insurance.	Limitations All of sample African-American, and lower socio-economic setting. Overall A robust study with appropriate design for study questions (including validation of self-reporting) providing evidence of increased utilisation by poorer students, of student confidence in youth-targeted service.

Table 1. The impact of youth-targeted primary care on access and utilisation (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Pastore et al. 1998) USA	Cross-sectional with comparator of SBHC non-users within same school Level III	Survey of users vs non-users of SBHC within one school in New York and the mental health (self-reported) of youth participants. Survey tools were all previously validated: Depression self-rating scale Violence survey Suicidal ideation/attempt survey SBHC perceptions survey N= 630 Filled survey in physical education class. Total in school=1500	Age Mean age is 16.0 years Ethnicity Black 61% Hispanic 30% Asian/White 9%	60% of sample registered at SBHC More females than males were frequent users (>3 visits/year). No differences in frequent users, average users and non-users by age, grade, ethnicity or self-reported mental health variables Reasons for not using SBHC <ul style="list-style-type: none"> • already had physician • did not need it • prefer continuing with current primary care provider • parents were opposed to SBHC • concerns about confidentiality. 	Limitations <ul style="list-style-type: none"> ▪ method of selection of participants not described ▪ absentees/non-physical education students excluded ▪ no evidence to support statement "study sample representative of 1500 students enrolled in school" (notwithstanding nearly n=600 provides some reassurance about internal validity). Overall An adequate study with findings that differ from others – students accessing the SBHC in this study did not differ significantly from non-users nor report poorer mental health status.

Chapter 4: Effects of youth-targeted primary care on use of emergency/after-hours services

INTRODUCTION

A number of studies considered the impact of youth-targeted primary care on use of after-hours and emergency services. Emergency department and after-hours centres are used inappropriately for non-urgent visits as a source of primary care commonly by population groups with difficulties in accessing health services (Hider 1998; Wilson and Klein 2000). Often this involves late presentation of health problems, and generally it marks a failure of the primary health care system to address the needs of these groups. Emergency department visits are frequently non-urgent, fragment health care, and result in increased medical costs to the health system (Hider 1998; Wilson and Klein 2000; Young et al. 2001).

Adolescents are among those who use emergency departments and after-hours clinics inappropriately (Wilson and Klein 2000). A survey in the US showed that overall 4.6% of adolescents in the survey use the emergency department as their usual source of health care (Wilson and Klein 2000). Those using the emergency department were more commonly males, those with fewer financial resources, and adolescents from rural areas and African-Americans. The demographics of New Zealand youth that use the emergency department as their usual source of care were not available.

Reduced use of urgent and after-hours services is an important outcome of youth-targeted primary care services. It is important as a marker that young people are accessing appropriate primary care, and in reducing the unnecessary costs involved in providing urgent care to problems that can be solved by a primary care provider in office hours.

Five studies that considered the impact of youth-targeted primary care on emergency department use were identified (Britto et al. 2001; Kaplan et al. 1998; Kisker et al. 1994; Santelli et al. 1996a) and (Juszczak 1999). The details of the studies by Kaplan and Juszczak have been discussed in **Chapter 3**, but are included under this heading in **Table 2 (pages 36 – 39)** also.

APPRAISAL OF STUDIES

Santelli et al. (1996a)

Santelli et al. (1996a) used a cross-sectional survey to evaluate 3,258 adolescents' self-reported use of primary care, emergency department and hospital visits. Nine urban schools with SBHCs, and four schools without SBHCs were surveyed using an anonymous written questionnaire adapted from previously validated questionnaires. Demographic profile of survey respondents was 73% Black, 22% White and 5% Other. Mean age of students in SBHC schools was slightly younger (14.4 years vs. 14.7 years). Similar percentages of students in each group were eligible for reduced-cost school lunches, and reported similar percentages of chronic illnesses.

Students in schools with health centres reported significantly lower rates of hospitalisation (OR 0.8 95% CI 0.66-0.98), as well as emergency department use. Logistic regression estimated the independent influence of emergency department use after controlling for other predictors such as gender, ethnicity, and chronic illness. Reduced emergency department use was limited to students attending the school which had had a health centre for more than one year (OR 0.78 95% CI 0.62-0.99). Students from SBHC schools were significantly more likely to report seeing a social worker (Adjusted OR 1.48 95% CI 1.13-1.95) and counsellor (Adjusted OR 1.3 95% CI 1.04 – 1.61) than students at

non-SBHC schools. There were no differences found for the time since the last visit to a doctor, or since a physical examination between schools with, or without a health centre.

Limitations to this study include no description of methods for subject selection raising a possibility of selection bias. The schools used are not strictly comparable and although closely matched, there are some demographic differences between schools with, and without SBHCs. Self-reporting of health status and health service use has unknown reliability and validity.

Overall, this study provides evidence that youth-targeted primary care services in the form of a SBHC can reduce use of emergency departments, hospital admissions, and also increase access to primary care, particularly to mental health professionals.

Britto et al. (2001)

Britto et al. (2001), performed a prospective evaluation of school-based health services using a cross-sectional study over two years. The study sought to determine whether provision of school-based medical and mental health services among other interventions, such as anger management groups and substance abuse prevention programmes, affected adolescents' use of needed medical care, preventive care and reduced emergency department use.

There were six intervention schools (2,832 students) and six demographically matched (gender, age, ethnicity and school district) comparison schools (2,036 students). However, there were significant differences between intervention and control groups at baseline for gender, ethnicity, grade, maternal education and school location. These differences in control and intervention groups (maternal education, ethnicity and rural vs. urban school), were statistically controlled.

Teachers administered a previously validated written questionnaire with a poor response rate of 42%. Approximately 21% of students were absent on the day of the survey, and a further 13% of returned surveys were invalid. Survey respondents had a median age of 15 years, 56% were female and 34% reported chronic health problems. Ethnically, 51% were White and 42% were Black.

The proportion with reported missed care and the utilisation outcomes (physical examinations, dental visits, mental health visits or emergency department visits in the past year), did not differ between students in control or intervention schools.

There are several methodological limitations to this study. It did not randomly assign schools to control or intervention roles; demographically the schools were different at baseline, which is likely to influence final outcomes. Follow-up was relatively short. The study assumed independent groups in the two years, but in fact, takes two 'slices' of student opinion, and does not follow a cohort longitudinally. Many of the students may not have replied to the survey in both years. Further, there are data limitations, particularly the low survey response rate causing an unrepresentative view of student health. The school absentees are likely to be different (socio-economic status, health risk behaviours etc.), than those at school. Data is also self-reported without external mechanisms for validation.

Whilst this poor quality study described significant gaps in perceived need and utilisation of health services, it did not find increased utilisation or access in schools with physical and mental health services on site, and suggests that those utilising health services within schools are those with the greatest health needs.

Kisker et al. (1994)

The study by Kisker et al. (1994) is discussed more fully in the following chapter on health outcomes. It studied 3,050 students in 19 different schools, and found that access to a SBHC did not reduce emergency department use. The control used in this evaluation was a sample of urban youth country-wide identified by random digit dialling, and differed from the SBHC group in a number of ways. Although these were controlled for, it is difficult to assess what impact SBHC access truly had on emergency department use.

Juszczak (1999)

As detailed in **Chapter 3**, Juszczak (1999) compared health care provider utilisation among students with SBHC access who used the health centre, students with SBHC access who didn't use the health centre, and students without SBHC access who instead used traditional non-youth-focussed primary care services. Describing utilisation of emergency departments and urgent care, Juszczak found greater urgent care use by adolescents who had no access to a SBHC – i.e. those adolescents use urgent care services four times more frequently than students with access to a SBHC. Odds ratio of 4.34 (95% confidence intervals 3.44 – 5.47).

Kaplan et al. (1998)

The details of the study by Kaplan et al. (1998) are given in **Chapter 3** and **Table 2 pages 36 – 39**. It reported a population of adolescents all insured with the same managed care provider, some with access to a SBHC, and others without SBHC access. A 33-55% reduction in emergency department use among those adolescents with access to a SBHC was demonstrated.

DISCUSSION

These studies found varying results of the impact of youth-targeted primary care on emergency department use. Consideration of the robustness of methods used in these studies clarifies issues. Studies that used more robust methods reported a statistically significant reduction in emergency department use associated with access to youth-targeted primary care – e.g. (Juszczak 1999; Kaplan et al. 1998).

Juszczak (1999) found youth who had never had access to a SBHC, were four times more likely to use the emergency department. Kaplan et al. (1998), found students with SBHC access used the emergency department a half to a third times less often than students without SBHC access. Santelli et al. (1996a), described significantly reduced emergency department use among students who had attended a SBHC school for greater than one year (OR 0.78). Britto et al. (2001) and Kisker et al. (1994), found no difference in emergency department use between students with, and without, SBHC access. They were less robust and used comparator groups that differed significantly.

Reduced emergency department use with access to targeted primary care has been confirmed in studies considering the impact of a SBHC on emergency department use by primary school students (Kaplan et al. 1999; Young et al. 2001). The study by Young et al. (2001), used emergency department records over two years to consider students enrolled at two primary schools and their emergency department usage. It showed a significant decrease in non-urgent emergency department visits and appropriately, no difference in urgent emergency department visits by students with access to a SBHC on school days. Kaplan et al (1999), did a robust retrospective cohort study that showed access to a SBHC was independently and significantly related to less emergency department use.

It is important to consider the different health care setting of the United States in interpreting and extrapolating these results. All school-based health services in the US are provided free while emergency department visits are charged in all cases (a minimum of US\$300 per visit) (Morone et al. 2001; Wilson and Klein 2000). Thus, a student without health insurance will be billed for that visit with a clear financial incentive to be seen for free at the school clinic the next day. The situation in New Zealand is clearly different with most emergency department visits not charged, and after-hours clinics incurring a maximum cost of \$40.00.

In summary, the research evidence supports reduced emergency department use by youth who have access to youth-targeted primary care. This is likely to be due to appropriate accessing of care for non-urgent problems with a primary care provider, and to result in cost savings both to the patient and urgent care providers, particularly in the US health care setting.

Table 2. The impact of youth-targeted primary care on use of emergency departments

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Santelli et al. 1996a) USA	Cross-sectional survey Level III	Evaluation of effect of SBHCs on use of emergency departments and Hospital care using 9 schools with SBHCs and 4 schools without (Baltimore) and schools comparable demographically. N=3258 respondents Survey tool Class administered written questionnaire (previously validated) Response rate not described.	Mean Age in schools SBHC 14.4y Non-SBHC 14.7y Ethnicity Black 73% White 22% Other 5% % students eligible for reduced price lunches SBHC 60% Non-SBHC 57%	SBHC students Odds ratios and 95% Confidence intervals Hospitalisation 0.8 (0.66-0.98) Emergency dept use 0.78 (0.62-0.99) (attending SBHC school >1 year) Social worker 1.48 (1.13-1.95) Counsellor 1.3 (1.04-1.61) No statistical difference between SBHCs and non-SBHCs for rates of chronic health conditions, time since last visit to Dr or last physical examination.	Limitations <ul style="list-style-type: none"> cannot exclude selection bias as no description of sample selection or overall response rate comparison schools differ in some demographic aspects self-reporting of health status and health service use is not objective appropriate and objective survey tool and generally appropriate methodology and analysis. Overall This study demonstrates reduced hospitalisation and use of emergency departments by students with access to a SBHC as well as increased access to social worker and counsellor in a school with SBHC.

Table 2. The impact of youth-targeted primary care on use of emergency departments (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Britto et al. 2001) USA	Prospective Cross-sectional study Level III	A study of impact of SBHC on utilisation for under-served youth. Six schools with intervention (SBHC and mental health services as well as anger management, substance abuse prevention etc.) (N=2832) and six demographically matched schools (N=2036). Survey tool 106 item written questionnaire (previously validated) administered in class. Target population all 7 th to 12 th grade students. Final response rate 42% of whole school populations (Mean 21% absent on survey days and 13% of filled questionnaires invalid.	Median age (years) SBHC 15 years Non-SBHC 15 years Ethnicity Black 42% White 51% Other 7% Gender Female 56% Note – despite matching, several significant differences exist between intervention and control schools.	Reported missed health care (did not seek medical care they believed they needed) over 45% for both SBHC and non-SBHC schools. Utilisation outcomes There was no significant difference between students at intervention and control schools. <ul style="list-style-type: none">▪ nurse visit past year▪ check-up past year▪ dental visits past year▪ mental health visit past year▪ emergency department visit past year.	Limitations Schools are demographically different from the outset. Follow-up is short (1 year). The study assumes the respondent groups are independent over the two years but in fact it is likely that many were the same students. Data limitations include a low response rate (potential for selection bias and self-reported data with its lack of validation/ objective measures. This study misses the important opportunity for a prospective longitudinal cohort study by not following the same students from the first to second surveys. Comment This methodologically poor study does not demonstrate increased access and utilisation to health care, nor reduced emergency department use in schools with school-based health centres.

Table 2. The impact of youth-targeted primary care on use of emergency departments (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Kisker and Brown 1996; Kisker et al. 1994) USA	Prospective cross-section (initial and follow-up surveys) with national comparator group Level III	Evaluation of impact of SBHCs in 19 schools over 3 years N= 3050 students with access to SBHC Target population (Initial survey) all students at entry level to high school (9 th and 10 th grades) Response rate 57% (Initial) 79% (Follow-up) N= 859 urban youths without access to SBHC (9 th and 10 th grades) Response rate 75% (Initial) 87% (Follow-up)	Ages at follow-up survey (both groups) 17 – 20 years Students with SBHC National urban youth Male 44% African-American 32% Hispanic 44% White 15% Other 9% Low SES 44% 50% 28% 20% 45% 8% 29%	Access and utilisation Over 50% of SBHC students used SBHC Significantly higher utilisation by uninsured, chronic illness and female students and students in Senior year. Health knowledge SBHC students showed greater health knowledge. Health risk behaviour No difference in contraceptive use, sexual activity, smoking, alcohol and substance use, marijuana use. Health status No difference in self-reported physical and mental health status or pregnancy rates between students with or without SBHC access. Emergency dept use No significant difference in use between students with or without SBHC access.	Limitations Poorly matched comparison group – risk of confounding factors for observed differences between students with access to SBHC and national urban youth controls. No description of survey instruments' validation or content. Low response rates to initial survey – risk of non-respondent bias – authors analyse this and considered non-contributory. Comment This study could have more conclusive and better results with a well-matched comparison group. Overall This study suggests SBHCs enhance health care access, utilisation and knowledge but do not alter risk behaviours or health status.

Table 2. The impact of youth-targeted primary care on use of emergency departments (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Juszczak 1999) USA	Retrospective cohort using clinical records Level II	A study of adolescent use of primary care and mental health across multiple delivery sites. Sample Group 1 Access to SBHC and Do not Use N=240 Group 2 No Access to SBHC N = 459 Group 3 Access to SBHC and Use N=213 N= 582 adolescents with N= 4569 total consultations (SBHCs and Clinics) Study period 1990-1992 (3 years) Data extraction Single clinical coder reviewing patient notes at SBHCs and Primary Care clinics using ICD 9.	Gender Male 39% Age (years) Mean 16.2 y Range 13 – 22 Ethnicity (Clinic users) Hispanic 67% Black 16% White 13% Insurance Status Medicaid 24% Ability to pay 70%	Mean annual visit rate (p<0.01) SBHC users 5.3 GP clinic users 3.3 Mental health services/visits SBHC users 26% GP clinic users 4% Note 97% of all mental health visits occurred in SBHCs Positive predictors of SBHC use Male No Medicaid Behavioural RFs Age 18-22 Reproductive RFs Injury RFs Use of emergency department/urgent care Four times more likely for youth who had never used a SBHC OR=4.34 (95% CI 3.44-5.47)	Limitations Data extraction method lacks validation/ repeatability checks. Schools non- randomly selected and one of the comparison groups (non-users in the same school) unlikely to be comparable (self- selection bias). Comment This fairly robust study provides strong evidence to support increased access and utilisation of primary and mental health services within youth-targeted care. Mental health is accessed eight times more frequently at SBHCs. Use of SBHC also reduces emergency and urgent care service utilisation relative to non-users. SBHCs provide access to adolescents with the greatest health risk factors.
(Kaplan et al. 1998) USA	Retrospective cohort Level II	A study of utilisation of health services by insured (Kaiser Permanente Colorado) teenagers with access to a SBHC (N=240) compared to matched insured (KPC) teenagers without SBHC access (N = 116). Consultation information extracted from ICD coding (SBHCs) and medical notes. Total visits N=3394	Age range 14-18 years Ethnicity not provided SES Participants and controls matched (details not given) Insurance status Participants and controls all in managed care with a managed care insurance scheme Kaiser Permanente Colorado (KPC).	Mental health (MH) visits Access to SBHC N= 303 No access to SBHC N= 11 No substance abuse visits out of SBHCs Use of after-hours care Reduced use by 33 – 55% Preventive care 80.2% with SBHC 68.8% without SBHC (p<0.04) Diagnosis SBHCs had fewer "accident" type presentations and a significantly greater proportion of gynaecological visits.	Limitations Reduced external validity – as participants all insured with one scheme and no description of the ethnicity and socio- economic profiles of participants. Comment This robust study provides evidence of increased access and utilisation of primary health care services through SBHCs. This is particularly apparent in the mental health, substance abuse areas where there is 10 times greater use at SBHCs. It supports reduced need for urgent and after-hours care as well as increase preventive health visits with comprehensive primary care.

Chapter 5: The effect of youth-targeted primary care on health outcomes

INTRODUCTION

There are potentially wide ranges of health outcomes among youth that could be evaluated. It would be quite reasonable to measure asthma control, diabetic control or compliance with anti-convulsant medication. However, only the health outcomes typically associated with adolescents such as contraceptive use, substance abuse or unplanned pregnancies have been evaluated in the studies identified in this review.

There were very few studies that evaluated outcomes of youth health targeted primary care. This has been identified by other authors (Dryfoos 1995; Dryfoos et al. 1996). This review identified only four studies that specifically defined health status outcomes from youth-targeted primary care services, and which fitted inclusion criteria.

APPRAISAL OF STUDIES

Kirby et al. (1993)

Kirby et al. (1993), considered the effects on SBHCs birth rates in five schools using a cross-sectional survey. This study calculated yearly birth rates for each of the five schools, using as a denominator all female students in attendance, and as numerator, female students identified on county birth certificates.

Results show wide fluctuation in birth rates for individual schools from year to year. There were no associations between clinic presence and birth rate, with logistic regression to control for differences in schools, nor when data was aggregated to observe trends in time.

Authors commented that sexual behaviour of youth is difficult to change. It is possible that chance fluctuations in school birth rates obscured a small impact from SBHCs. An effect may have been apparent by restricting observation to female users of the SBHCs, rather than school-wide birth rates, although this analysis was not performed.

This study was primarily limited by lack of a control group to observe concurrent trends in birth rates among adolescents without SBHC access. It did not measure other health outcome such as concurrent abortion rates and contraceptive use. It is possible that birth rates increased at a greater rate in schools without SBHCs, and that SBHCs reduced the degree of increase. Overall, the study did not find a reduction in birth rates in schools with a SBHC.

Kirby et al. (1991)

Another study by Kirby et al. (1991) looks at the impact of school-based clinics and sexual behaviour of youth. This study surveyed four schools with SBHCs that were demographically and geographically matched with schools without a clinic. Two further SBHC schools conducted surveys before starting a SBHC, and two years after the SBHC. The six SBHCs served different populations, were located in rural and urban settings, and offered different reproductive health services – e.g. only three of the clinics dispensed contraceptives.

The ethnicity of the sample varied at each school, but at five of the six schools, over 75% of students were Black. Ages and socio-economic status of students were not described.

Clinic records and a student health survey were used to assess reproductive health services and their impact. The written survey was piloted and reliability was assessed as adequate. The target population for the survey was the whole school, although in two schools, only selected classes were surveyed. Response rates varied from 24% to 90% with non-response mainly due to absentees and failure to bring parental permission. There was no difference in reported sexual activity or pregnancy rates between clinic and non-clinic schools. There was a significant increase in reported use of condoms and oral contraceptive pills at two of the six clinic schools compared to non-SBHC schools.

This study did not control for confounding factors (e.g. at a national level there was increased condom use and HIV awareness during the study period). It missed the opportunity for a longitudinal cohort or full case control study (and therefore more robust results) in the two schools where baseline surveys were performed. It relied on self-reporting for pregnancy and sexual behaviour without attempts to validate measures.

Kisker and Brown (1996)

Kisker and Brown (1996) and Kisker et al. (1994), reported on access, health status and risky health behaviours with a larger report, and a shorter condensed journal article. It is described in detail in **Chapter 3**. The authors evaluated 19 SBHCs in a prospective cross-sectional study with an initial and follow-up survey, and described 3,050 students who had completed both surveys.

Access to SBHCs did not reduce high-risk behaviours, and had little or no effect on self-reported health status, mental health status and pregnancy rates.

This study is limited by lack of a well-matched comparison group and a low response rate (57%) to the initial survey risking a non-respondent bias. Limitations are discussed further in **Chapter 3**.

Brindis et al. (1994)

Brindis et al. (1994), reviewed patient charts in four different SBHCs in four high schools to consider contraceptive use among adolescent female youth. The authors used a cross-sectional study design.

The sample consisted of 162 females accessing family planning services at least once during an academic year. Charts were selected if the medical record contained at least three months of contraception related information. The sample was 63% Hispanic, 25% Black, 7% Filipino and 20% were eligible for entitlement programmes such as school lunches or food stamps. Ages of the sample were not described.

Data extraction from clinical notes was performed reasonably using valid and reliable methods. Data analysis used linear and stepwise regression.

Results demonstrated that clients with more contacts with the family planning programme had a higher rate of contraceptive use. This showed a 'dose-response' effect with an increase in contraceptive use by an average of 3% with each family planning contact ($p < 0.01$). There was no increase in contraceptive use from availability of contraceptives on-site, appointment frequency greater than monthly or whether dispensed during the consultation. Only 7% of the variance (R^2) in contraceptive use was explained by this model.

Limitations to this model include reduced external validity without description of the sample's age composition, non-random selection of schools and most importantly, lack of a comparator group. Whilst this study reported increased use of contraceptives associated with increased SBHC utilisation, it only explained 7% of the variance and clearly, there are many other factors contributing to adolescents' use of contraceptives.

DISCUSSION

These four studies all evaluated reproductive health outcomes. Clearly, these outcomes are an area of importance in adolescent health, and ARE also of some political importance in the United States. The findings in relation to the effect of youth-targeted primary care on reproductive health outcomes are inconclusive.

The study by Kirby has inconclusive results about whether access to a SBHC impacts positively on sexual activity, and contraceptive use or pregnancy rates. Further, Kirby et al. (1993) finds no change in birth rates in schools with or without a SBHC. Brindis et al. (1994), describes a small but significant increase in use of contraception and a family planning programme with attendance at a SBHC. Kisker and Brown (1996) and Kisker et al. (1994), found no change in contraceptive use, pregnancy rates or in self-reporting of physical and mental health status among high school students with SBHC access. Only one of these four studies evaluating health outcomes among users of youth-specific health services found an improvement in health status with access to a SBHC.

A full copy of a study examining teen pregnancy rates and youth-specific primary care (Kirby 2001) could not be obtained. This study reviewed programmes to reduce teen pregnancy and reported that most studies involving SBHCs did not increase sexual activity, but neither did they increase school-wide contraceptive use. Two studies were identified that did increase contraceptive use. This is in keeping with the findings of this report.

The studies appraised in this section suffer from a number of research challenges. All four studies assessed self-reported health status or behaviours such as sexual activity and contraceptive use. Pregnancy rates are the only outcome assessed here that can be independently measured, yet calculations of pregnancy rates also have inherent difficulties. Problems include use only of live-birth data (thus numbers of terminations of pregnancies are not known), difficulty identifying births by adolescents (who often drop out of school without pregnancy being cited as a reason), and involvement of multiple obstetric providers. There is further discussion of the challenges of health outcome and evaluation research in **Chapter 7**.

Different methods of estimation of pregnancy rates can result in different data. In the early 1980's, data published from St. Paul, Minnesota, showed significant declines in pregnancy rates in schools with SBHCs (Dryfoos et al. 1996). One of the studies appraised here re-examines these data and shows large year-to-year fluctuations, and no impact of the clinics on pregnancy rates (Kirby et al. 1993).

All four of these studies have methodological limitations and only one demonstrated a significant (but small) improvement in health status that can be attributed to access to a SBHC. The most reasonable conclusion from these studies is that there is insufficient evidence to support improved health outcomes attributable to access to a youth-targeted primary care programme. This is in part due to a lack of studies using sufficiently robust methodologies. This is clearly an area where further research is urgently required.

Table 3. The impact of youth-targeted primary care on health outcomes

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Kirby et al. 1993) USA	Cross-sectional study Level III	Evaluation of the effect of SBHCs on birth rates among youth Five schools with SBHCs and birth rates calculated in years preceding and after installing SBHC. Birth rate = $\frac{N(BC)}{N(Tot)}$ i.e. Female students on birth certificate/Total female students at schools. Controlled for school dropouts, changes of schools etc.	Ages Grades 9-12 except one school grades 10 - 12 Ethnicity and Socio-economic status Not described	Birth rates 3 of the 5 schools showed no change in school-wide birth rates. 1 of 5 showed large but statistically insignificant decrease in birth rates. 1 of 5 showed significant increase in birth rates which disappeared when changing demographics controlled for. No associations with clinic presence and birth rates with aggregation of data to observe trends in time, nor when differences between schools controlled for with logistic regression.	Limitations <ul style="list-style-type: none"> no validation of methods of birth rate estimation significant differences between school studies there is no control/comparator group without access to a SBHC external validity limited by no demographic description of students outcome measured (birth rates) has multi-factor causes which cannot be controlled for easily in a descriptive study. Overall This study shows no change in birth rates in schools after introduction of a school-based health centre.
(Kirby 1991) USA	Cross-section (several variations) Level III	Evaluation of the impact of SBHCs on sexual and contraceptive behaviour across 6 schools. Survey and Review of clinic records of: 4 schools with SBHCs compared with 4 matched (by proximity and demographics) schools. 2 schools with SBHCs with surveys before and 2 years after set-up of SBHCs. Note- each school provided different types of reproductive health packages. Survey tool Piloted and reliability tested Response rate 24-90% Review of clinic records Data extraction method not described.	Age and socio-economic status Not given Ethnicity In 5 schools Black >75% In 1 school Black 30% Hispanic 20% Filipino 40%	Sexual activity (age for first intercourse/frequency in last month) No difference between SBHC and non-SBHC schools. Contraceptive use Significant increase in use of condom and contraceptive pill in 2 of the 6 schools. Pregnancy No significant reduction or increase in SBHC schools. Reproductive consultations Varied in schools from 3-26% of all consults.	Limitations <ul style="list-style-type: none"> poor study design assessing 6 diverse sites (rural, urban, different States) with varying reproductive health services and with two methods of assessment (this study missed an opportunity for a longitudinal cohort study or a full case control trial) we cannot ascribe causality to increased condom and birth control use in 2 schools – during study period there was rising HIV awareness and condom use nationally. Overall This study suggests that SBHCs may increase contraceptive use but do not alter self-reported sexual activity or total pregnancy rates in schools.

Table 3. The impact of youth-targeted primary care on health outcomes (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Kisker and Brown 1996; Kisker et al. 1994) USA	Prospective Cross-section (initial and follow-up surveys) with national comparator group Level III	Evaluation of impact of SBHCs in 19 schools over 3 years N= 3050 students with access to SBHC Target population (Initial survey) all students at entry level to high school (9 th and 10 th grades) Response rate 57% (Initial) 79% (Follow-up) N= 859 urban youths without access to SBHC (9 th and 10 th grades) Response rate 75% (Initial) 87% (Follow-up)	Ages at follow-up survey (both groups) 17 – 20 years Students National with urban SBHC youth Male 50% 44% 50% African-American 32% 28% Hispanic 44% 20% White 15% 45% Other 9% 8% Low SES 44% 29%	Access and utilisation Over 50% of SBHC students used SBHC Significantly higher utilisation by uninsured, chronic illness and female students and students in Senior year. Health knowledge SBHC students showed greater health knowledge. Health risk behaviour No difference in contraceptive use, sexual activity, smoking, alcohol and substance use, marijuana use. Health status No difference in self-reported physical and mental health status or pregnancy rates between students with or without SBHC access. Emergency dept use No significant difference in use between students with or without SBHC access.	Limitations <ul style="list-style-type: none"> poorly matched comparison group – risk of confounding factors for observed differences between students with access to SBHC and national urban youth controls no description of survey instruments' validation or content low response rates to initial survey – risk of non-respondent bias – authors analyse this and considered non-contributory. Comments This study could have more conclusive and better results with a well-matched comparison group. Overall This study suggests SBHCs enhance health care access, utilisation and knowledge but do not alter risk behaviours or health status.

Table 3. The impact of youth-targeted primary care on health outcomes (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments												
(Brindis et al. 1994) USA	Cross section Retrospective Chart review Level III	Evaluation of the effect of SBHCs on contraceptive use using chart review in 4 SBHCs based in Californian high schools. Sample selection Patient charts with: <ul style="list-style-type: none"> ▪ minimum of 3 months consecutive contraceptive info ▪ one consult in 1990/91 school year. Data extraction Used validated methods and tested for reliability and repeatability. Data analysis Methods described to determine contraceptive ratio, used linear and stepwise regression.	Ages Not given Gender All female Ethnicity <table style="display: inline-table; vertical-align: top; margin-left: 10px;"> <tr><td>Hispanic</td><td>63%</td></tr> <tr><td>Black</td><td>25%</td></tr> <tr><td>Filipino</td><td>7%</td></tr> <tr><td>Other</td><td>5%</td></tr> </table> Health insurance <table style="display: inline-table; vertical-align: top; margin-left: 10px;"> <tr><td>Private</td><td>27%</td></tr> <tr><td>Medicaid</td><td>9%</td></tr> </table>	Hispanic	63%	Black	25%	Filipino	7%	Other	5%	Private	27%	Medicaid	9%	Increased contraceptive use with increased utilisation of family planning programme in SBHC. This showed 'dose-response' effect with 3% increase in contraceptive use ration with each contact ($p < 0.01$). No increase in contraceptive use from: <ul style="list-style-type: none"> ▪ availability of contraceptives on site ▪ appointment frequency > 1/month ▪ contraceptives dispensed during consult. Only 7% of variance (R^2) explained by this model.	Limitations There is no comparator group, non-random selection of schools and no description of sample's age composition. Overall This study uses robust methodology to provide evidence of a small increase in contraceptive use with greater utilisation of a youth-targeted primary care service. Clearly multiple factors contribute to adolescent contraceptive use.
Hispanic	63%																
Black	25%																
Filipino	7%																
Other	5%																
Private	27%																
Medicaid	9%																

Chapter 6: New Zealand studies related to youth health and primary care

Two studies performed in New Zealand met the inclusion criteria for this review (Chavasse et al. 1995; Geddes 1997). These have been included in the New Zealand studies section rather than in the main body of the literature to emphasise their New Zealand focus.

Apart from the above studies, no other NZ youth-specific primary care service has performed adequately rigorous evaluations of health status, access or utilisation. In this review, it was important to confirm validity of the research from the US to local needs, and thus, include relevant New Zealand information and research. Some of the New Zealand studies are of either qualitative nature or less robust quantitative methods, or do not deal specifically with youth-targeted primary care – so do not meet inclusion criteria. New Zealand studies were identified using the broadened inclusion criteria and search strategy given in the methods.

Evidence-based medicine is traditionally based upon the findings of quantitative research (Mays and Pope 1995; Popay 1996) which have a clear advantage over qualitative research in issues of reliability. There is increasing recognition that there are relevant research questions that are best and perhaps uniquely, answered using qualitative methodologies, and which can contribute with greater validity. Although these are less easily assessed than quantitative methods, their inclusion is important, and methods for critical appraisal including use of checklists have been developed with increasing refinement (Mays and Pope 1995; Popay 1996; Greenhalgh and Taylor 1997; Health Evidence Bulletins - Wales Accessed on 15 December 2001).

New Zealand studies that have used these methods illustrate the need for youth-targeted primary care, describe barriers to access, and qualities of a successful youth-targeted primary care service using the perspective of youth as clients. The following studies were identified and appraised. A number of other NZ studies and reports that were not included here (although they may have contributed to the Background and Introduction), are listed in **Appendix 5**.

Included NZ studies

Chavasse et al. (1995)

Chavasse et al. (1995), performed a three-phase cross-sectional study describing a school doctor clinic at a secondary high school in central Auckland, New Zealand. The first phase used a written survey based on previously validated questionnaires to assess adolescents' perceptions of their own health status and use of primary care services. Sample selection was by use of random number selection of classes. The second phase described the school doctor clinic over a three-month trial phase including diagnostic coding. The third phase was an anonymous clinic-based satisfaction survey available in the clinic waiting room. There was no comparator group.

A total of 221 students responded to the health status/primary care survey representing a 75% response rate. The sample matched the demographic profile of the school population. Respondents had an age range of 13 to 19 years. Ethnically, students were 27% Indian/Asian, 9% Maori, 51% European and 8% Pacific students.

Over the three-month period, there were 224 consultations and 346 diagnoses made by 142 students at the school doctor clinic. Demographically, clinic users were significantly more female, Maori and European students than the rest of the school. Asian and Indian students were low clinic users. Age of clinic users reflected the school population structure. The three main reasons for accessing the school doctor clinic were 'Thought the doctor could treat them', 'Easy to get to', and 'No cost involved'. The

vast majority of students reportedly thought a school doctor clinic was a 'good' idea because of its easy access, no cost and confidential nature.

Limitations of this study include lack of a comparator group, its short duration, no described piloting of the questionnaire, self-reporting of student health status (unknown reliability) and reduced external validity, as it based in only one urban New Zealand high school. There is no description of sample size power calculations. This descriptive study gives a "snapshot" picture of a SBHC, but is significantly limited particularly by lack of a comparison group. This means it is impossible to ascribe any outcomes to the presence of a youth-specific service. Overall, this study finds a high level of access, acceptance and utilisation of a school-based youth-specific primary care service in a New Zealand school.

Geddes (1997)

Geddes (1997), performed a consumer satisfaction evaluation for the youth health centre based in central Christchurch. The objective of the research was to assess whether this primary care youth-targeted health service was accessible, acceptable and appropriate for the client group. A survey assessed views of youth. The questionnaire was piloted and validated. There was calculation of adequate sample size and methods.

Open-ended questions resulted in qualitative data, and thematic analysis was used to interpret responses. The author does not describe her position to the topic and potential for bias. Results used sequences of original data. Survey data collected (but not qualitative data), is available for independent assessment. There was no description of independent assessment of thematic analysis. There were 115 respondents and a response rate of 93%.

Demographics of the sample closely matched the reference group of all clientele of the service. Respondents were 71% female, with 94% in the age range of 15 to 25 years. Ethnically, respondents were 79% European and 17% Maori.

Results showed that approximately 80% of respondents had visited the doctor or nurse, and a third had visited the counsellor. Most had heard about the service from a friend, and used the service between one and five times. The majority of respondents found the youth health centre suitably located and easy to find, although over a quarter were dissatisfied with opening hours and appointment making procedures. The majority of respondents felt the service was acceptable. The most common reasons for using the Centre were that it was free (77%), the staff were friendly (21%), it had a comfortable atmosphere (12%) and it was convenient and youth oriented. If the Centre was not available, 30% of respondents said they would not have gone anywhere else.

Surveyed youth in this study of client satisfaction found the service generally accessible, acceptable and appropriate. Lack of a comparison group, self-reporting, and lack of independent verification of data interpretation limit its usefulness. It missed exploration of the detailed information that can be added by qualitative research by not performing face-to-face interviews with participants.

Additional NZ studies (using broader inclusion criteria)

Raeburn (1996)

Raeburn (1996), performed a non-systematic literature review that aimed to evaluate studies of one stop shop child and youth health services. Search and data extraction, and synthesis methods were not described. There are 74 citations within the reference section. Studies are not described or appraised individually, but under several theme areas chosen by the authors that include: Philosophy, Issues and Problems addressed, Models and Examples, Evaluation of Effectiveness, Components of Successful programmes, New Zealand Examples and Conclusions.

The section discussing evaluation of effectiveness is of most relevance in the scope of this review. The authors note that only 20 of the 74 studies they examined, made specific reference to evaluation; only six of these reported actual results.

None of them report on youth-focussed primary care health services. In their conclusion, the authors note 'the data showing the effectiveness of such integrated/holistic services is not substantial'.

This study has a number of serious limitations related to the lack of systematic approach to methods of literature searching, and data extraction and analysis.

Murdoch and Silva (1996)

Murdoch and Silva (1996), studied the use of general practice services by 18 year olds in New Zealand's Dunedin Multidisciplinary Health and Development Study. There were 879 participants with a 98% response rate. The sample selection was likely to be unbiased. Questions consisted of a verbal survey and a written survey using a six-point Likert scale. There was no description of validation, or piloting of survey questions or method. Ethnically, the sample was predominantly European and had only 3% Maori – thus, it was not ethnically representative of the larger population. All participants were aged 18 years.

Results showed 88% of participants had consulted their usual general practitioner in the past 12 months, 14% the emergency department, 16% had visited family planning, and 4% had visited the student health service. Other service providers included the STD clinic and Other GP. Significantly more females than males had consulted a doctor in the past year. There was a high level of reported satisfaction with all doctors consulted. Problems reported in seeing their own general practitioner included embarrassment with doctor, inconvenient times, and cost and concerns about confidentiality. Generally, participants expressed a preference for a doctor of the same gender as themselves.

This quantitative study described primary care utilisation patterns by predominately European Dunedin 18 year olds, as well as perceived access barriers and provider preferences. Very few participants had accessed a targeted youth health service.

Sporle (1993)

Sporle (1993), was commissioned to provide a pilot survey of Auckland adolescents' perceptions of their health needs. This survey used a qualitative methodology with focus groups facilitated with a semi-structured format. There is clear description of methods used for sampling to select focus group participants (representative of the different geographic regions and age ranges of adolescents as well as Maori and Pacific young people and those with special needs). The interview process and schedule were described. The researcher described his ethnicity and role. There was no description of methods of data interpretation or independent interpretation of tape transcripts.

The study involved 198 young people who were part of 22 focus groups, with an age range of 13 to 24 years. The participants were 60% European, 28% Maori, 10% Pacific Island, and 2% Asian. They differ significantly from the ethnic composition of the Auckland 15 to 19 year group in the 1991 Census (more Maori and fewer Pacific and European). Participants were 59% female.

Adolescents described their likely health-seeking behaviours in response to three imagined scenarios that included an acute injury, non-traumatic pain, and a more personal health problem. The type of health service reported as likely to be sought was correlated with young people's gender and age, and access to a school health nurse. Help-seeking behaviour was likely to be delayed by males and older students generally, and school students were more likely to use school personnel (e.g. school nurse) or refer to their parents. For an acute injury or non-traumatic pain, young people reported being most likely to seek help with a General Practitioner. For more intimate health problems, young people reported they would use STD clinics, General Practitioner services or Family Planning. Young people suggested cost of prescriptions and doctor's visits as barriers to early contact, and concerns about confidentiality and cost as major concerns for using local General Practitioners.

Regardless of age, ethnicity or gender, young people in this study expressed a preference for health services that were specific and distinctly provided for young people. Young people ideally wanted a health service that was accessible, affordable, comprehensive and staffed by people who were non-

judgemental and culturally sensitive. This was seen as an alternative to current primary care provision rather than an adjunct.

Use of imaginary rather than real health scenarios, as well as lack of independent data analysis, limited this study. Overall, this study of reasonable quality describes attitudes to health service provision of youth generally, as well as those with higher health needs in urban Auckland, and their preferences for youth-targeted services.

Te Puni Kokiri (1994)

Te Runanga o Te Rarawa was contracted by Te Puni Kokiri (1994), to provide advice on how to include the views of young Maori males on their health needs, as well as the most appropriate design and delivery of effective health programmes. Although this study primarily focussed on health promotion programmes, it is included in this section because participants also describe barriers to access of primary care. Maori male youth/rangatahi are a sub-population of New Zealand youth at high risk, and understanding of their views and responses is imperative in any health service provision.

The researchers were two health project co-ordinators of Te Rarawa descent (male and female). The target group was Maori males at three schools. Methods of data collection were participative and used facilitated discussions with the young men. A team (composition described), evaluated the effectiveness of the project providing independent analysis of the data gathered. The relationship of the researchers to the participants is described. There was no description of the numbers of participants, form and duration of facilitated discussions, how participants were chosen, or procedures for data analysis and interpretation. The results are credible and include sequences from the original data, although this cannot be sourced or independently assessed.

Described health needs were broad and included information on emotional and social development, and life skills as well as specific health issues such as drugs and alcohol, sexuality and abuse. In discussing issues of sexuality, participants defined it as important that the person/health provider had an understanding and empathy with Maori culture, but preferably not someone close in age or kinship. Issues of confidentiality were important in all settings. Existing agencies and services were seen as intimidating and not always confidential where community or whanau members ran them.

Lack of information makes it difficult to appraise study quality. This report appears to use generally appropriate methods to describe perceptions of health needs and preferences about service providers by young Maori males.

Hennessy (1996)

Hennessy (1996), studied the social desirability and feasibility of establishing a Youth Wellness Centre in Dunedin. This included research among youth of Otago using quantitative as well as qualitative research methods. The qualitative research used focus groups and brainstorming sessions to amplify survey findings. There were 350 participants selected from rural and urban high schools, work training schemes, tertiary institutions, unemployed youth and youth with special needs. The survey had been previously validated and piloted among 12 to 20 year olds. Standard focus group methods were used for brainstorming and focus group discussions with survey participants, after completion of the written survey.

There was a 75.7% response rate to the survey (n=265). Males and females were represented equally with an age range of 12 to 20 years. There was no description of ethnicity of participants, and demographics of the sample population differed from the youth population in Dunedin (statistical details not given) in age structure and occupation. Participant selection intentionally targeted groups perceived to have reduced access to health services.

Three-quarters of respondents had used a health service in the past 12 months with 5.2 mean annual visits. Health services most frequently accessed were General Practitioner, Family Planning and Dentist. Despite high health service use, 56% of young people reported unmet need – i.e. they had had a problem (including relationship/literacy as well as more health related problems) for which they did not seek help.

Primary reasons for not seeking help (in descending order of importance), were ‘didn’t want to make a fuss’, ‘felt embarrassed’, ‘costs too much’, ‘confidentiality concerns’ and ‘didn’t know where to go’. Three-quarters of young people stated a preference for a service targeting young people and 88% of respondents stated they would use such a service.

This study used adequate methods to describe health service use and barriers to access among youth in Otago.

Gray (1994)

Gray (1994), reported young people’s views on health and disability support services. Focus group discussions with 234 young people were supplemented with a small questionnaire completed by 221 of these young people. There are no details of piloting or validation of this questionnaire. Facilitated discussions were tape recorded and transcribed. The use of qualitative methods was justified, and while the sampling appears to include deliberate representation of minority and at-risk groups, this was not adequately described. There was no description of the author’s position on the topic. The details of recruitment of participants were not given, and there was no description of the procedures used for data extraction or interpretation.

Demographics of survey participants show 129 female (58%) and 87 males (42%). The age range of participants is 10 to 24 years. Ethnically, there were 51% European, 23% Maori, and 18% Pacific Islands. Demographics of the reference population was not given.

Results from focus group discussions were presented under a variety of headings. Young people aged 10 to 14 years identified the main health issues as general medical problems such as colds and acne, as well as accidents and injuries. Health issues for 14 year olds were mental health problems, sexuality issues, abortion, sexual abuse and drug and alcohol problems. Additional health issues identified by Maori were smoking, violence and abuse and sex education. Pacific Island participants identified their most important health issues as learning about sex and drug and alcohol problems. Young people with disabilities identified the lack of services targeted to their age group, transport and access, and the cost of medication as most important health issues to them. Young people described barriers to existing health services as embarrassment, waiting too long, and cost and distance to travel. Maori and Pacific Islands participants also described lack of culturally appropriate services as a barrier to access.

Results showed that 66% of the larger sample had visited a General Practitioner in the previous six months, 60% had visited a pharmacy, 24% had used counselling services, 17% had used accident and emergency services, and 10% had visited a registered nurse. Maori rangatahi accessed medical services (General Practitioners and accident and emergency services) similarly to the larger sample, but fewer Maori had visited a nurse or pharmacist compared to the overall sample. Maori participants were more likely to have gone to a counsellor in the last six months (significance not given). Many Maori participants felt current services were inappropriate for Maori.

This study emphasises differing views on health service use and needs by sub-populations of young people, and underlines recurring themes of the barriers to health care for young people. Youth-specific services were seen as a priority particularly for personal health care services such as sexual and mental health, although existing services were generally regarded as adequate for medical and accident/injury problems.

Overall, the qualitative methodology used in this study has important limitations as described above. It provides insight on views of young people on health and disability services in New Zealand.

DISCUSSION OF NEW ZEALAND STUDIES

The eight studies from New Zealand appraised here add importantly to this review. While the findings of Chavasse et al. (1995) and Geddes (1997) contribute to **Chapter 3**, the other six studies add an important perspective, portraying the views of New Zealand young people.

The study by Murdoch and Silva (1996) described GPs as the primary care providers used by 88% of 18 year olds in Dunedin. Clearly, general practitioners continue as the main primary care providers for the vast majority of youth in this country. Other providers such as student health or family planning, only made up 12% of all primary care provision. Nonetheless, this sample identified significant barriers to access at their GPs which are repeated in other studies in New Zealand (Chavasse et al. 1995; Geddes 1997; Gray 1994; Hennessy 1996; Sporle 1993).

These barriers included cost of doctor's visit as well as prescriptions, concerns of confidentiality, embarrassment, distance to travel, inconvenient times, and lack of cultural appropriateness. These overlap markedly with access barriers described by US youth, and thus, give confidence in the applicability of other aspects of the US research. It appears that the same issues need to be addressed in health service provision in New Zealand.

The contribution of New Zealand research

Research from New Zealand provides important insight into New Zealand youth's perceptions of their health needs and their preferences for service provision. Youth clearly indicate support and preference for youth-targeted primary health services. Important in this research are the views of groups that are less well served by the current system. A number of these studies (Gray 1994; Hennessy 1996; Sporle 1993; Te Puni Kokiri 1994), deliberately sampled/over-sampled Pacific and Maori youth, young parents, and unemployed and disabled participants to ensure adequate inclusion and representation of their views.

An important contribution from these studies is the clearly expressed preference by Maori and Pacific youth for health service providers who are culturally appropriate and competent. This was not explicitly described as an access barrier in the US studies. At the same time, there was a preference expressed for providers that were not from the same small community, not closely related and not peers (Gray 1994; Sporle 1993; Te Puni Kokiri 1994).

New Zealand studies mention the preference expressed by the vast majority of youth respondents for youth-specific services when asked (Geddes 1997; Hennessy 1996; Sporle 1993). This was not explicitly asked in any of the US studies.

The paucity of New Zealand youth health outcome evaluations

New Zealand studies have not performed outcome evaluations of existing services that are essential to demonstrate the effectiveness of such services. Clearly, this problem is not limited to New Zealand, with only four studies for this review identified as evaluating health outcomes. The paucity of health service and programme evaluation studies among youth in New Zealand has been discussed in a review of early interventions to prevent mental illness in young people (Nicholas and Broadstock 1999, p 64). Factors identified by these authors as contributing to this situation were:

- priority – anyone working with youth health fully occupied in service delivery
- planning – process evaluations used for immediate value, but outcome evaluations often not thought of until after programme completion excluding pre- and post-testing type studies
- skills – rigorous outcome evaluations complex and time consuming requiring research skills that those involved in programme implementation may not have
- resources – many programmes have insufficient resources or short-term contracts that do not permit outcome evaluations.

In summary, New Zealand studies portray the views of our youth/rangatahi related to access to primary health care and their provider preferences. These intersect to a large extent with access barriers identified in the US research base. Additional preferences identified by New Zealand youth included cultural appropriateness and youth-targeted health services.

Table 4. New Zealand studies related to youth and primary health care

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Chavasse et al. 1995) New Zealand	Cross-sectional Level III	Evaluation of a school doctor clinic in a NZ secondary school - described in 3 ways: 1. Written health status survey of students n=221 (22% of the school population). Survey previously validated and sample selection by random number selection of classes. Response rate 75%. 2. Diagnostic coding summary (224 consultations and 346 diagnoses over 3 months). 3. Client satisfaction survey (n=108) Voluntary participation. Response rate 76%.	Age range 13-19 years Ethnicity (survey/school) European 51% Indian/Asian 27% Maori 9% Pacific 8% Ethnicity/Gender of clinic users Significantly more Maori and European, and significantly fewer Indian/Asian than school population. Significantly more females used clinic than school population.	Had seen no other provider with this problem 69% Clinic survey Clinic 'good' idea (because no cost, easy to access and confidential) 95% Written health status survey Self-rating of health Excellent/good 84% Visit to GP in past 12 mths <67% Diagnosis Skin 22% Respiratory 16% Musculo-skeletal 14% Contraception/Pregnancy 8% Sexual health 6%	Limitations The short duration of study (3 months) masks true utilisation rates. No description of piloting of surveys after adaptation from previously validated questionnaires, no comparator group and self-reporting of student's health status (unknown reliability). There is reduced external validity to other New Zealand settings given the lower proportion of Europeans and higher proportions of Indian/Asians than the general population. Overall A robust study with appropriate design. It demonstrates significant uptake of a school-based primary care service in New Zealand with greater utilisation by Maori, European and females than others in the school population.
(Geddes 1997) New Zealand	Cross-sectional Level III with qualitative component	A validated and piloted written survey of client satisfaction with a specific youth-targeted primary care service in central Christchurch. Method Survey using closed and open-ended questions. There is description of appropriate methods of participant recruitment, data extraction and analysis (thematic analysis of responses to open-ended questions). Target population n=120 Respondents n=115 Response rate = 93%	Age range 15-25 years 94% Ethnicity European 79% Maori 17% Other 4% Gender Female 70.5% The sample is demographically very similar to youth health centre clientele.	Reasons for using this service No cost 77% Friendly staff 21% Comfortable atmosphere 12% Convenient 9% Youth oriented 8% If this service were unavailable Other primary care provider 61% Would not go anywhere 30% Don't know 8% Results are credible, including sequences of the original data. Respondents describe this specific youth health service as accessible, acceptable and appropriate. Some dissatisfaction expressed with opening hours and appointment making procedures.	Limitations <ul style="list-style-type: none"> no description of position of author no comparator group is surveyed describing their views on their primary care service provision, which would have significantly strengthened the study's findings sources of qualitative data cannot be determined there is no description of independent assessment of thematic analysis. Comment Overall this study uses appropriate methods and provides evidence of a high level of client satisfaction with a youth-specific primary care service in urban New Zealand.

Table 4. New Zealand studies related to youth and primary health care (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Raeburn 1996) New Zealand	Non-systematic literature review	Literature review describing and evaluating one stop shop health services to children and youth. No method given for search methods, data extraction. There is no appraisal of individual study quality.	NA	Studies are described by themes and not individually. 74 citations of which 6 studies report evaluation and results.	This study is limited by poor methodology but does view international literature from a NZ perspective and acknowledges the limited evidence base for the effectiveness of integrated services.
(Murdoch and Silva 1996) New Zealand	Cross-sectional level III	A study of primary care utilisation among Dunedin 18 year olds. The sample (n=879) made of 18 year olds were part of a larger longitudinal study. Response rate 98% Survey Verbal survey with written component.	Age 18 years Ethnicity Maori 3% European 97% (assumed as no other breakdown provided) Occupation Full time study 45% Employed 29% Unemployed/ 26% Training schemes	Medical help in past 12 months Usual GP 88% Family planning 16% Emergency dept 14% Other GP 12% Student health 4% Significantly more females had used health services in the past 12 months. Satisfaction with doctor – high for all providers. Problems with own GP Inconvenient times, problem with payment, embarrassment with doctor, worried parents would be told.	Limitations <ul style="list-style-type: none"> ▪ no description of validation or piloting of survey ▪ self-reported responses have unknown reliability ▪ options of normal medical service sought only allowed one choice. Overall This is a robust study that describes patterns of utilisation of primary care by predominately European 18 year olds in Dunedin, as well as indications of barriers to GP access and levels of satisfaction with doctors previously attended.

Table 4. New Zealand studies related to youth and primary health care (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Te Puni Kokiri 1994) New Zealand	Participative using focus groups – qualitative type method and a questionnaire	A study that seeks to describe perceived health needs of Maori male youth as well as define appropriate health promotion and education for this group. Facilitated discussion (focus group type although this term is not used) as well as a survey were used (survey results not published for confidentiality concerns). Gender and ethnicity of researcher is given. There is likely independent interpretation of data by accountability of the researchers and the project to a project team.	Age range High school students Ethnicity Maori 100% Gender Male 100%	Results are credible, including sequences of the original data. Perceived health needs <ul style="list-style-type: none"> information on emotional and social development life skills information drugs and alcohol sexuality violence/abuse. Tobacco and marijuana were not perceived health risks to participants. Health Educator/Provider preference <ul style="list-style-type: none"> understanding/empathy with Maori culture not someone who is too close in age not closely connected by kinship issues of confidentiality important in all settings. 	Limitations There is no description of methods of individual participant recruitment or methods used for data extraction and interpretation. The form of the facilitated discussion numbers in the groups and ages of participants are not described. Overall This study uses appropriate methods to describe perceived health needs by Maori males in northern New Zealand. These are important in working with a group not served well by current mainstream health services.
(Hennessy 1996) New Zealand	Cross-sectional Level III supplemented by focus groups	A feasibility evaluation for a planned youth health centre in Dunedin using a previously validated and piloted written survey and focus groups among surveyed youth (standard methodology described) among youth of Otago. Sample selection Over-sampling of 'at-risk' groups. Recruitment of individuals not described Target population n=350 Response rate 75.7% (n=265)	Age range 12-20 years Gender M=F Ethnicity Not described at individual level. Sample differs from reference population in age structure, ethnicity and occupation.	Health services youth aware of GP 74% Family Planning 37% Public Health Nurse 29% Unmet health need (have symptoms but did not access service 56% Reasons for not seeking health service <ul style="list-style-type: none"> did not want to make a fuss felt embarrassed costs too much confidentiality concerns. Preference for youth-specific service 79% Results are credible and include sequences of the original data.	Limitations Author does not state her position and potential bias related to the topic. Presentation of results data does not clarify which data originates from quantitative and qualitative methods. Methods of data extraction and interpretation for qualitative data are not given and there is no evidence of independent interpretation of tape transcripts. Comment Overall this study has appropriate methods for quantitative data and insufficient methodological detail for the qualitative data. It provides insight into access barriers for primary health care for youth as well as preferred health services used by youth in southern New Zealand.

Table 4. New Zealand studies related to youth and primary health care (continued)

Author Country	Study design Level of evidence	Setting	Sample demographics	Results	Comments
(Gray 1994) New Zealand	Qualitative study using focus group discussions supplemented by a questionnaire (cross-sectional)	A description of youth views and use of health and disability services. Focus group technique described and appropriate. Facilitated discussions with tape recording and transcripts. Sequences from original data are presented (although not able to be sourced). 35 groups with n = 234 participants. Questionnaire – no description of piloting or previous validation. Response rate 94.4% n = 221	Survey participants (no demographics of reference population provided). Age range 10-24 years Ethnicity European 51% Maori 23% Pacific 18% Other 8% Gender Female 58%	Barriers to existing services Embarrassment, waiting too long, cost and distances to travel. Maori and Pacific people also described lack of cultural appropriateness. Use of health services in last 6 months GP 66% Pharmacy 60% Counselling 24% Emergency dept 17% Nurse 10% Family Planning 10%	Limitations There is no description of sampling/ recruitment methods or the position of the author as focus group facilitator and potential bias'. There is no description of methods of data extraction or interpretation, or of independent interpretation of tape transcripts. Comment Overall this study uses generally adequate qualitative methods and poor methods for quantitative data. It provides insight into health needs and service access issues and use for youth in central New Zealand.

Chapter 7: General discussion, summary and conclusions

GENERAL DISCUSSION

Methodological issues

This report is limited by both the low volume and relatively poor quality of studies assessing outcomes of youth-specific primary care services. This problem is an international one and is certainly not limited to New Zealand. Although there are over 1,300 SBHCs operating in the US, only four studies that evaluated health outcomes of SBHCs were identified and could be included in this review.

This report uses the US Preventive Services Taskforce Protocol (1989) to grade the quality of evidence. This is a rigorous and useful tool for clinical preventive services, but has some limitations when used on interventions that are less discrete and community-based.

Randomisation of individuals is practically and ethically very difficult in an intervention such as youth-specific primary care, meaning few or no studies have the gold standard quality of evidence level I. The US Preventive Services Task Force criteria (1989) finds 21 of the included studies of evidence level III (cross-sectional studies) and two of the studies of evidence level II - 2 (retrospective cohort studies). There are no studies that randomly assign the intervention. Thus, all the evidence is found in the lower levels of evidence (levels II and III) and is therefore not regarded as equivalent quality to the type of evidence that supports clinical services although it is difficult to achieve randomised controlled trials.

The unit of assignment is in some cases to a group (the school) rather than an individual – e.g. analysis of school birth rates, with or without access to a SBHC (Kisker and Brown 1996). This requires a cluster analysis approach and a larger sample size to maintain precision of treatment/intervention effects (Murray 1998). Others have proposed alternative tools to evaluate the quality of evidence of community level interventions (Rychetnik and Frommer 2001). These have yet to gain widespread recognition.

The US preventive services tool can also be limited in that it does not rank the quality of comparison groups used. Thus, a retrospective cohort study such as that by Juszcak (1999), which compared users and non-users of a SBHC within the same school, is classified as evidence level II. This is problematic, as it is likely that the populations differ significantly due to problems with self-selection bias – e.g. students may not use the health centre because they have better health and are socio-economically more advantaged. However, the use of same school comparison groups may result in the intervention and comparison groups being matched on many of the important confounders such as socio-economic status or ethnicity.

Other studies could be considered to have a more appropriate comparison group (matched students in a school without a SBHC), yet use a cross-sectional design such as Santelli et al. (1996a), and thus are classified as evidence level III. In assignment of evidence levels, this study could be considered as equivalent evidence to a descriptive study without any comparator group such as Brindis et al. (1995) where it is clearly methodologically superior.

However, when these caveats are recognised, this tool is an extremely useful one. As with all critical appraisals, it is important to consider the internal validity and individual merit of a study's methodology, as well as assigning an evidence grade in assessing study quality.

How applicable are the US studies to New Zealand?

The applicability of this research from the US setting to New Zealand is clearly of paramount importance to the usefulness of this report. Valid comparisons do not require populations to be demographically identical but they should in some way be representative of the target population. Thus, health services which seek to target groups of young people who are disadvantaged (e.g. ethnic minorities, socio-economically deprived) can expect that many of the findings of these studies, where SBHCs have been established in areas of greater need, should hold in a New Zealand setting.

At the same time, the different health care setting of the US must be borne in mind in generalising findings, such as the reduced use of emergency departments, to New Zealand where emergency department visits are not charged.

Challenges of research in youth-specific primary health

The evidence most useful to policy makers and those who allocate health care resources, is evidence of health gain from specific services. This is, unfortunately, often the outcome most difficult to measure, and too often it is not included in evaluation studies. In general, health outcome evaluations are more difficult than others are, as they require longer time for follow-up and larger sample sizes to control for confounding effects. This is further complicated in the arena of adolescent health by the nature of the population (Dryfoos et al. 1996). These authors described the difficulties and limitations of current research, and evaluation under the following headings:

challenges of conducting research in schools – bureaucratic delays and difficulties in research conducted by an external agency within a school setting

parental consent – parental consent is often required both for enrolment in clinics as well as for participation in evaluations

‘moving targets’ – high mobility of the most vulnerable sectors of youth populations

random assignment – of interventions is an ideal method in research yet is a difficult one, especially at student level

lack of comparison groups – there are problems with comparing students in a non-intervention school as well as using clinic users and non-users within the same school

self-reporting – especially of sexual behaviour or substance use is a commonly used method, although there is unknown reliability and validity

school change versus individual changes – measuring the effects of aggregate data, e.g. changes of the school population where there is a SBHC versus data of individual clinic users

small samples – less common behavioural outcomes, such as suicide, require very large sample sizes to demonstrate programme impact within a set timeframe

confounding variables – usually there are multiple factors that contribute to a change in health status. It is difficult to distinguish between the effects of competing interventions.

Other difficulties that contribute to challenges in research include poor response rates and school absenteeism, both sources of respondent bias.

The lack of good quality outcome-oriented evaluations is reflected by these challenges. However, despite these difficulties, health outcome evaluations must be urgently prioritised in health services research if policy is to be based on evidence.

Limitations of current research base

The vast majority of studies appraised in this review (22/23) evaluated youth-specific primary care set in schools. These were rarely accessible to youth not attending that school, and maybe because of this miss providing access to youth who are most at-risk (school drop-outs, unemployed, street kids). The only study that evaluated a comprehensive primary care service targeting youth (Geddes 1997) did not have a comparator population and looked primarily at client opinion.

No studies evaluating the effectiveness and impact of adolescent clinics within a general practice were identified, although this would have fulfilled inclusion criteria of a youth-specific primary care service. This model is one that requires research and investigation as it could provide a medical home while catering for youth-specific needs.

SUMMARY

This report systematically reviewed the international evidence for the impacts of youth-specific primary care. Outcomes considered were access and utilisation, emergency department use, and health outcomes and mental health (access and mental health status). Approximately 443 articles were identified by the search strategy from which 80 articles were identified and retrieved in full text as potentially eligible for inclusion. Of these, a total of 23 studies were selected for appraisal.

A further six studies which did not fit the inclusion criteria, were included in the section of New Zealand studies that related to youth and primary care more generally.

Access and utilisation

Seventeen studies considered the impact youth-targeted primary care has on access and utilisation. Two were retrospective cohort studies and the remainder cross-sectional studies. All 17 studies reported high levels of utilisation of youth-specific primary care services. Seven studies reported on relative health service utilisation by youth users of SBHCs versus comparator groups without access to a SBHC. All seven described significantly greater utilisation (mean annual visits) of health services by students with access to youth-targeted care.

Evidence suggests that young people who particularly benefit from enhanced access are those who are socio-economically less advantaged, females and high-risk youth. Some studies demonstrate increased access for ethnic minorities, but the evidence is not clear. There is evidence supporting increased access for rural youth compared to urban youth using SBHCs.

Overall evidence clearly supports enhanced access to primary health care through youth-specific services.

Mental health

Eight studies considered access and utilisation of mental health services within primary care, and two studies evaluated the effect on self-reported mental health status.

Four studies evaluating accessing of mental health services at a SBHC, described greater utilisation of youth-targeted services. Of two robust retrospective cohort studies, Kaplan et al. (1998), showed mental health visits were 10 times higher in students with SBHC access, compared to students without access to SBHCs. As Juszczak (1999) demonstrated, males with SBHC access were 45 times more likely to access mental health service than those with only traditional primary care. Mental health consultations made up one-fifth to one-quarter of all consultations at a SBHC (Anglin et al. 1996; Jepson et al. 1998).

Two studies found no statistical difference in use of the SBHC related to self-reported mental health variables (Kisker and Brown 1996; Pastore et al. 1998).

Evidence supports enhanced utilisation of mental health services within a youth-specific primary care service, but shows no evidence of improved self-reported mental health status among clinic users.

Emergency department use

Five studies evaluated the impact of youth-specific primary care on emergency department use. Three studies (these are the methodologically more robust), describe significant reductions in emergency department use by students with access to youth-specific primary care. Juszczak (1999), found youth who have never had SBHC access, were six times more likely to use the emergency department than youth with SBHC access. Kaplan (1998) found students with SBHC access, used the emergency department half to a third as often than those without SBHC access. This is confirmed by Santelli for students who had SBHC access for greater than one year (Santelli et al. 1996a). The two studies showing no difference in emergency department use between students with, and without SBHC access, are less robust. Softer methodologies and comparator groups that differ significantly from study samples, weaken their evidence.

On balance, evidence suggests youth-targeted primary care reduces emergency department usage. Further research is required to confirm this.

Health outcomes

Only four studies assessed health outcomes among young people using youth-specific primary care. All four studies assessed outcomes related to reproductive health (sexual activity, contraceptive use, pregnancy rates), and all were methodologically poor to moderate in quality. One study described a small, but significant increase in reported condom and contraceptive pill use after school-based health services started in two of six schools. The remainder of the studies showed no difference in health outcomes between SBHC and non-SBHC schools.

There is insufficient evidence to demonstrate improved health outcomes among young people using youth-targeted primary care. Further research is urgently needed in this area.

New Zealand studies

Eight New Zealand studies were discussed and appraised. Two of these fitted the inclusion criteria and contributed to the access and utilisation section of the systematic review. The remaining six studies added a New Zealand perspective to issues of access and primary care provider preferences. The views of young New Zealanders/rangatahi add validity to the findings from US studies.

Access barriers were defined by youth in six studies (Chavasse et al. 1995; Geddes 1997; Gray 1994; Hennessy 1996; Murdoch and Silva 1996; Sporle 1993). These included cost of doctor's visit, cost of prescriptions, concerns of confidentiality, embarrassment, distance to travel, inconvenient times, and lack of cultural appropriateness. These overlap markedly with access issues described by US youth, and give confidence in the applicability of other aspects of the US research. Three studies note the importance of cultural appropriateness of health care providers to Maori and Pacific youth (Gray 1994; Sporle 1993; Te Puni Kokiri 1994). Cultural appropriateness is not explicitly described in any of the US literature.

New Zealand studies also reported a strong preference by the vast majority of youth respondents (over 80% in all three studies where their opinion was sought) for youth-specific services. New Zealand and US studies identify similar access barriers to primary care for young people and a clear preference for youth-specific primary care.

CONCLUSIONS

Evidence strongly supports enhanced access and utilisation of primary care and mental health services within primary care, by young people through youth-specific services. It suggests youth-specific primary care can reduce emergency department use. Currently, there is insufficient evidence to demonstrate changes in physical or mental health status through youth-specific primary health care.

There is, therefore, an urgent need for further New Zealand based and international research to determine the effectiveness of youth-specific primary health services. It should address limitations in study design and types of evaluation discussed in this review. These should include appropriate matched comparator groups.

Importantly, studies are needed that evaluate health outcomes of attendance at youth-specific primary health services. If funds are to be invested into such programmes, it is essential to know what effect these have on health status.

References

- Adelman, H. S., Barker, L. A., & Nelson, P. (1993). A study of a school-based clinic: Who uses it and who doesn't? *Journal of Clinical Child Psychology*, 22, 52-59.
- Andrulis, D. (1998). Access to Care is the centerpiece in the elimination of socioeconomic disparities in health. *Annals of Internal Medicine*, 129, 412-416.
- Anglin, T. M., Naylor, K. E., & Kaplan, D. W. (1996). Comprehensive school-based health care: high school students' use of medical, mental health, and substance abuse services. *Pediatrics*, 97, 318-330.
- Anonymous (Accessed on 15.12.01). Checklists: Qualitative Research checklist: British Medical Journal Available from: www.bmj.com/advice/33.html.
- Balassone, M. L., Bell, M., & Peterfreund, N. (1991). A comparison of users and nonusers of a school-based health and mental health clinic. *Journal of Adolescent Health*, 12, 240-246.
- Bartman, B., Moy, E., & D'Angelo, L. (1997). Access to ambulatory care for adolescents: The role of a usual source of care. *Journal of Health Care for the Poor and Underserved*, 8, 214-226.
- Brindis, C. (1995). Promising approaches for adolescent reproductive health service delivery. The role of school-based health centers in a managed care environment. *Western Journal of Medicine*, 163, 50-56.
- Brindis, C., Kappahn, C., McCarter, V., & Wolfe, A. L. (1995). The impact of health insurance status on adolescents' utilization of school-based clinic services: Implications for health care reform. *Journal of Adolescent Health*, 16, 18-25.
- Brindis, C., Starbuck-Morales, S., Wolfe, A. L., & McCarter, V. (1994). Characteristics associated with Contraceptive Use Among Adolescent Females in School-Based Family Planning Programs. *Family Planning Perspectives*, 26, 160-164.
- Britto, M. T., Klostermann, B. K., Bonny, A. E., Altum, S. A., & Hornung, R. W. (2001). Impact of a school-based intervention on access to healthcare for underserved youth. *Journal of Adolescent Health*, 29, 116-124.
- Chavasse, M., North, D., & McAvoy, B. (1995). Adolescent health - a descriptive study of a school doctor clinic. *New Zealand Medical Journal*, 108, 271-273.
- Clark, T. (2001). Enhancing access to health services for young people. *New Ethicals Journal : New Zealand's Journal of Patient Management*, 4, 37-40.
- Crespo, R. D., & Shaler, G. A. (2000). Assessment of school-based health centers in a rural state: the West Virginia experience. *Journal of Adolescent Health*, 26, 187-193.
- Crosby, R. A., & St Lawrence, J. (2000). Adolescents' use of school-based health clinics for reproductive health services: data from the National Longitudinal Study of Adolescent Health. *Journal of School Health*, 70, 22-27.
- Dryfoos, J. G. (1995). Full service schools: Revolution or fad? *Journal of Research on Adolescence*, 5, 147-172.
- Dryfoos, J. G., Brindis, C., & Kaplan, D. W. (1996). Research and evaluation in school-based health care. *Adolescent Medicine: State of the Art Reviews*, 7, 207-220.
- Feehan, M., McGee, R., & Williams, S. (1993). Mental health disorders from age 15 to age 18 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 32, 1118-1126.

Fergusson, D., Horwood, L., & Lynskey, M. (1993). The prevalence and comorbidity of DMS-III-R diagnoses in a birth cohort of 15 year olds. *Journal of the American Academy of Child & Adolescent Psychiatry*, 32, 1127-1134.

Fothergill, K., & Ballard, E. (1998). The school-linked health center: a promising model of community-based care for adolescents. *Journal of Adolescent Health*, 23, 29-38.

Frenk, J. (1998). Medical care and health improvement: the critical link. *Annals of Internal Medicine*, 129, 419-420.

Geddes, N. (1997). *A consumer satisfaction evaluation for the 198 Youth Health Centre : dissertation submitted as partial requirement for the degree of Master of Public Health*. Unpublished MPH, Dunedin: University of Otago.

Gray, A. (1994). *From counselling to cough mixture: young people's views on health and disability support services*. Wellington: Ministry of Youth Affairs.

Greenhalgh, T., & Taylor, R. (1997). How to read a paper: papers that go beyond numbers (qualitative research). *BMJ*, 315, 740-743.

Group Health Cooperative of Puget Sound (1996). *Provider education and guidelines*. Seattle: Group Health Cooperative of Puget Sound.

Health Evidence Bulletins - Wales (Accessed on 15 December 2001). Additional questions to assist with the critical appraisal of a qualitative study: Available from: <http://hebw.uwcm.ac.uk/methodology/appendix9.htm>.

Hennessy, S. (1996). *Youthealth: a community model for youth health service delivery within Otago. Report of research project towards the degree of Masters Business Administration*, Massey University.

Hider, P. (1998). *Emergency department attendance: a critical appraisal of the key literature. NZHTA Report No. 8*. Christchurch: New Zealand Health Technology Assessment.

Jepson, L., Juszczak, L., & Fisher, M. (1998). Mental health care in a high school-based health service. *Adolescence*, 33, 1-15.

Juszczak, L. (1999). *Use of health and mental health services by adolescents across multiple delivery sites*. Unpublished Ph.D thesis. New Haven, CT: Yale University.

Kaplan, D. W., Brindis, C. D., Phibbs, S. L., Melinkovich, P., Naylor, K., & Ahlstrand, K. (1999). A comparison study of an elementary school-based health center - Effects on health care access and use. *Archives of Pediatrics & Adolescent Medicine*, 153, 235-243.

Kaplan, D. W., Calonge, B. N., Guernsey, B. P., & Hanrahan, M. B. (1998). Managed care and school-based health centers. Use of health services. *Archives of Pediatrics & Adolescent Medicine*, 152, 25-33.

Keyl, P. M., Hurtado, M. P., Barber, M. M., & Borton, J. (1996). School-based health centers. Students' access, knowledge, and use of services. *Archives of Pediatrics & Adolescent Medicine*, 150, 175-180.

Kirby, D. (1991). School-based clinics: research results and their implications for future research methods. *Evaluation and Program Planning*, 14, 35-47.

— (2001). *Emerging answers - research findings on programs to reduce teen pregnancy: summary*. Available from: <http://www.teenpregnancy.org/>. Washington, DC.: National Campaign to Prevent Teen Pregnancy.

Kirby, D., Resnick, M. D., Downes, B., Kocher, T., Gunderson, P., Potthoff, S., Zelterman, D., & Blum, R. W. (1993). The effects of school-based health clinics in St-Paul on school-wide birthrates. *Family Planning Perspectives*, 25, 12-16.

- Kirby, D., Waszak, C., & Ziegler, J. (1991). Six school-based clinics: their reproductive health services and impact on sexual behavior. *Family Planning Perspectives*, 23, 6-16.
- Kisker, E. E., & Brown, R. S. (1996). Do school-based health centers improve adolescents' access to health care, health status, and risk-taking behavior? *Journal of Adolescent Health*, 18, 335-343.
- Kisker, E. E., Brown, R. S., & Hill, J. (1994). *Healthy caring: outcomes of the Robert Wood Johnson Foundation's school-based adolescent health care program*. Princeton, N.J.: Mathematica Policy Research.
- Klein, J. D. (2000). Adolescents, health services, and access to care. *Journal of Adolescent Health*, 27, 293-294.
- Klein, J. D., Slap, G. B., Elster, A. B., & Schonberg, S. K. (1992). Access to health care for adolescents: a position paper of the Society of Adolescent Medicine. *Journal of Adolescent Health*, 13, 162-170.
- Klein, J. D., Wilson, K. M., McNulty, M., Kappahn, C., & Collins, K. S. (1999). Access to medical care for adolescents: results from the 1997 Commonwealth Fund Survey of the Health of Adolescent Girls. *Journal of Adolescent Health*, 25, 120-130.
- Maskill, C. (1991). A health profile of New Zealand adolescents. Wellington: Health Research Services, Department of Health.
- Mays, N., & Pope, C. (1995). Rigour and qualitative research. *BMJ*, 311, 109-112.
- Morone, J., Kilbreth, E., & Langwell, K. (2001). Back to school: a health care strategy for youth. *Journal of Health Affairs*, 20, 121-136.
- Murdoch, J. C., & Silva, P. A. (1996). The use of general practice services by 18 year olds in New Zealand. *New Zealand Medical Journal*, 109, 113-115.
- Murray, D. M. (1998). *Design and analysis of group-randomized trials*. New York: Oxford University Press.
- New Zealand Guidelines Group (1997). Guidelines for Fellowship Training 12 - 23 October 1997. Wellington: Ministry of Health National Health Committee.
- New Zealand. Ministry of Youth Affairs (1994). *15 to 25: a youth statistical profile*. Wellington: Ministry of Youth Affairs.
- New Zealand. Ministry of Health (1995). *Effective health services for young people: te toiora o toku whanaketanga*. Wellington: Ministry of Health.
- (2002). *Youth health action plan*. Wellington: Ministry of Health.
- Nicholas, B., & Broadstock, M. (1999). Effectiveness of early interventions for preventing mental illness in young people: a critical appraisal of the literature. *NZHTA Report*, 2, 1-108.
- Pastore, D. R., Juszczak, L., Fisher, M. M., & Friedman, S. B. (1998). School-based health center utilization: a survey of users and nonusers. *Archives of Pediatrics & Adolescent Medicine*, 152, 763-767.
- Politzer, R. M., & Yoon, J. (2001). Inequality in America: the contribution of health centers in reducing and eliminating disparities in access to care. *Medical Care Research and Review*, 58, 234-248.
- Popay, A., Rogers, A., & Williams, G. ([1996]). *Rationale and standards for the systematic review of qualitative literature in health services*. Salford: University of Salford.

- Raeburn, J. M. (1996). *One stop shopping: integrated health, education and social services for young people*. Auckland: Northern Regional Health Authority.
- Rychetnik, L., & Frommer, M. (2001). *A proposed schema for evaluating on public health interventions. Version 3.1*. Sydney: National Public Health Partnership, University of Sydney.
- Santelli, J., Kouzis, A., & Newcomer, S. (1996a). School-based health centers and adolescent use of primary care and hospital care. *Journal of Adolescent Health, 19*, 267-275.
- (1996b). Student attitudes toward school-based health centers. *Journal of Adolescent Health, 18*, 349-356.
- Santelli, J., Morreale, M., Wigton, A., & Grason, H. (1996c). School health centers and primary care for adolescents: a review of the literature. *Journal of Adolescent Health, 18*, 357-366.
- Shi, L. (1992). The relation between primary care and life chances. *Journal of Health Care for the Poor and Underserved, 2*, 321-335.
- Sporle, A. (1993). *A pilot survey of Auckland adolescents' perceptions of their health needs*. Auckland: Auckland Group of the New Zealand Association for Adolescent Health and Development.
- Te Puni Kokiri (1994). *Te runanga o te rarawa: Maori male adolescent health project*. Kaitaia: Te Puni Kokiri.
- U.S. Preventive Services Task Force (1989). *Guide to clinical preventive services: an assessment of the effectiveness of 169 interventions*. Baltimore: Williams and Wilkins.
- Walter, H. J., Vaughan, R. D., Armstrong, B., Krakoff, R. Y., Tiezzi, L., & McCarthy, J. F. (1996). Characteristics of users and nonusers of health clinics in inner-city junior high schools. *Journal of Adolescent Health, 18*, 344-348.
- Watson, P. (2001). Adolescent health in NZ. *New Ethicals Journal : New Zealand's Journal of Patient Management, 4*, 23-26.
- Wilson, K. M., & Klein, J. D. (2000). Adolescents who use the emergency department as their usual source of care. *Archives of Pediatrics & Adolescent Medicine, 154*, 361-365.
- Young, T. L., D'Angelo S, L., & Davis, J. (2001). Impact of a school-based health center on emergency department use by elementary school students. *Journal of School Health, 71*, 196-198.
- Zimmer-Gembeck, M. J., Alexander, T., & Nystrom, R. J. (1997). Adolescents report their need for and use of health care services. *Journal of Adolescent Health, 21*, 388-399.

Appendix 1

SEARCH STRATEGIES

Medline

1. (clinic or clinics or service: or centre: or center:).ti. (106383)
2. (school: or teen: or adolescen: or youth or student: or university or college or tertiary).ti. (130637)
3. 1 and 2 (7160)
4. limit 3 to yr=1990-2001 (3046)
5. program evaluation/(12900)
6. comprehensive health care/ (4976)
7. review.pt. (826466)
8. ((systematic: adj3 review:) or (systematic: adj3 overview:)).mp. (3019)
9. cohort studies/ (31641)
10. longitudinal studies/ (28885)
11. evaluation studies/ (108576)
12. follow-up/ (244622)
13. "Outcome Assessment (Health Care)"/ (12093)
14. (outcome or evaluat:).ti. (217030)
15. randomized controlled trials/ or randomized controlled trials.pt. (19673)
16. controlled clinical trials/ or controlled clinical trial.pt. (60268)
17. effectiv:.mp. (414689)
18. meta-analysis.pt. or meta-analysis/ (8743)
19. Prospective Studies/ (136929)
20. or/5-19 (1857225)
21. 4 and 20 (754)
22. from 21 keep (SELECTED REFERENCES)

Embase

1. adolescen\$.mp. (231530)
2. youth.mp. (4045)
3. juvenile.mp. (12754)
4. young people.mp. (2583)
5. young person\$.mp. (536)
6. teenage\$.mp. (3405)
7. teens.mp. (678)
8. (drop\$ adj2 (centre\$ or centers)).mp. (50)
9. one stop shop\$.mp. (29)
10. (health adj (centre\$ or center\$ or clinic or clinics)).mp. (3789)
11. exp School Health Service/ (737)
12. school health care.mp. (24)
13. school health practice.mp. (0)
14. school health program\$.mp. (42)
15. school health service\$.mp. (760)
16. school health clinic\$.mp. (3)
17. school-based clinic\$.mp. (50)
18. or/1-7 (243942)
19. or/8-10 (3866)
20. or/11-17 (825)
21. 18 and 19 (588)
22. 20 or 21 (1368)
23. exp Quality of Life/ (28040)

24. exp Evaluation/ (4847)
25. exp Health Survey/ (9070)
26. exp Treatment Outcome/ or exp Outcomes Research/ or exp Health Status/ (129348)
27. (health and outcome\$.mp. (20251)
28. (outcome\$ and measure\$.mp. (53219)
29. exp Health Care Quality/ (206845)
30. or/23-29 (290590)
31. 22 and 30 (348)
32. from 31 keep (SELECTED REFERENCES)

Cinahl

1. adolescen\$.mp. (34539)
2. youth.mp. (1667)
3. juvenile.mp. (374)
4. young people.mp. (727)
5. young person\$.mp. (106)
6. teenage\$.mp. (1338)
7. teens.mp. (540)
8. (drop\$ adj2 (centre\$ or centers)).mp. (24)
9. one stop shop\$.mp. (38)
10. (health adj (centre\$ or center\$ or clinic or clinics)).mp. (1303)
11. school health care.mp. (13)
12. school health practice.mp. (2)
13. school health program\$.mp. (126)
14. school health service\$.mp. (1388)
15. school health clinic\$.mp. (3)
16. school-based clinic\$.mp. (67)
17. or/1-7 (35415)
18. or/8-10 (1361)
19. 17 and 18 (245)
20. exp Quality of Life/ (6137)
21. exp Evaluation/ (8203)
22. exp Health Survey/ (22525)
23. exp Treatment Outcome/ or exp Outcomes Research/ or exp Health Status/ (15134)
24. (health and outcome\$.mp. (7978)
25. (outcome\$ and measure\$.mp. (8712)
26. exp Health Care Quality/ (42360)
27. or/20-26 (82420)
28. School Health Services/ (1363)
29. or/11-16 (1466)
30. 19 and 29 (75)
31. (19 or 29) and 27 (510)
32. limit 31 to yr=1990-2001 (444)
33. from 32 keep (SELECTED REFERENCES)

Psychinfo

1. (clinic or clinics or service: or centre: or center:).ti. (23723)
2. (school: or teen: or adolescen: or youth or student: or university or college or tertiary).ti. (132095)
3. 1 and 2 (3442)
4. limit 3 to yr=1990-2001 (1602)
5. evaluation/ or measurement/ or mental health program evaluation/ or treatment outcomes/ or treatment effectiveness evaluation/ or program evaluation/ (39701)
6. 4 and 5 (99)
7. from 6 keep (SELECTED REFERENCES)(11)
8. schools/ (2038)
9. exp Mental Health Services/ (12259)
10. 5 and 8 and 9 (5)
11. school-based.ti. (860)
12. 5 and 11 (67)
13. limit 12 to yr=1990-2001 (54)
14. from 13 keep (SELECTED REFERENCES)(7)
15. school facilities/ (133)
16. limit 15 to yr=1990-2001 (43)
17. from 16 keep (SELECTED REFERENCES)(11)
18. high school students/ (17766)
19. primary health care/ (2253)
20. 18 and 19 (0)
21. 11 and 19 (1)
22. from 21 keep (SELECTED REFERENCES)(1)
23. 3 and 19 (11)
24. from 23 keep (SELECTED REFERENCES)(3)
25. school:.mp. and 19 (66)
26. limit 25 to yr=1990-2001 (63)
27. from 26 keep 48 (1)
28. (adolescent clinic or adolescent health clinic or adolescent health service).mp. (49)
29. (youth clinic or youth health clinic or youth health service:).mp. (5)
30. (school health clinic: or school-based clinic or school health service:).mp. (39)
31. (one stop shop: and (youth or teen: or adolescen:)).mp. (0)
32. (youth-specific or youth-targeted or youth focus:).mp. (49)
33. or/28-32 (142)
34. limit 33 to yr=1990-2001 (87)
35. from 34 keep (SELECTED REFERENCES)(7)
36. 7 or 14 or 17 or 24 or 27 or 35 (34)
37. health care utilization/ (4586)
38. 8 and 37 (4)
39. 2 and 37 (345)
40. 38 or 39 (345)
41. 40 and 1 (138)
42. limit 41 to yr=1990-2001 (103)
43. 42 not 36 (99)
44. from 43 keep (SELECTED REFERENCES)

Other Sources

Combinations of the index terms and additional keywords from the strategies above were used to search other sources of information without controlled vocabulary, or where the version used did not permit sophisticated searching.

Appendix 2

SOURCES SEARCHED

Bibliographic databases

Medline
 Embase
 Current Contents
 Social Science Citation Index
 Psycinfo
 Eric
 Cochrane Controlled Trials Register
 Index New Zealand

Review databases

Cochrane Database of Systematic Reviews
 Database of Abstracts of Reviews of Effectiveness
 NHS Economic Evaluation database
 Health Technology Assessment database
 Evidence-based reviews – ACP Journal Club

Library catalogues

New Zealand Bibliographic database – Te Puna
 British Library
 COPAC
 US National Library of Medicine

Websites

TRIP database (Turning Research into Practice)
 OMNI (Organised Medical Networked Information)
 UK Department of Health publications
 King's Fund publications list
 US National Campaign to Prevent Teen Pregnancy
 California's Healthy Start Initiative publications list
 Health Canada – and related sites
 Australian Department of Health & Aged Care – and related sites

Search engines

Google
 SEARCHNZ
 NZEDsearch

Other

NZHTA IN-HOUSE COLLECTION
 Experts in the field (see **Appendix 1**)
 Reference sections of retrieved papers Electronic contents pages for 1996 onwards for the *Journal of School Health* and *Journal of Adolescent Health*.

Appendix 3

NEW ZEALAND EXPERTS IN THE FIELD CONTACTED

- Dr Joan Alardyce, Director, Student Health, Canterbury University, Christchurch
- Dr Sue Bagshaw, Adolescent General Practitioner, 198 Youth Health Centre, Christchurch
- Terry-Ann Clark, The Centre for Youth Health, Manukau
- Dr Simon Denny, Harkness Fellow, Adolescent Health, University of Minnesota, USA
- Linzi Jones, Project Manager, Personal and Family Health, Ministry of Health
- Dr Peter Watson, Adolescent Paediatrician, The Centre for Youth Health, Manukau
- Raewyn van Gool, Youth Health Manager, Rotorua General Practice Group, Rotorua
- Dr Tania Pinfold, Rotorua General Practice Group, Rotorua
- Dr John Raeburn, Department of Behavioural Science, University of Auckland

Appendix 4

RETRIEVED STUDIES EXCLUDED FOR REVIEW (EXTERNAL TO NEW ZEALAND)

- Armbruster, P., Gerstein, S. H., & Fallon, T. (1997). Bridging the gap between service need and service utilization: A school-based mental health program. *Community Mental Health Journal*, 33, 199-211.
- Armbruster, P., & Lichtman, J. (1999). Are school based mental health services effective? Evidence from 36 inner city schools. *Community Mental Health Journal*, 35, 493-504.
- Bartman, B., Moy, E., & D'Angelo, L. (1997). Access to ambulatory care for adolescents: The role of a usual source of care. *Journal of Health Care for the Poor and Underserved*, 8, 214-226.
- Bocchino, C. (1991). School-based clinics: ensuring access to the health care for adolescent America. *Pediatric Nursing*, 17, 398, 418.
- Bruvold, W. (1990). A meta-analysis of the California school-based risk reduction program. *Journal of Drug Education*, 20, 139-152.
- Catron, T., & Weiss, B. (1994). The Vanderbilt School-based Counseling Program: an interagency, primary-care model of mental health services. *Journal of Emotional & Behavioral Disorders*, 2, 247-253.
- Cramer, M. W., & Iverson, C. J. (1999). Developing an evaluation plan for school health programs in Nebraska. *Journal of School Health*, 69, 51-57.
- Dryfoos, J. G. (1988). School-based health clinics: three years of experience. *Family Planning Perspectives*, 20, 193-200.
- (1994). Medical clinics in junior high school: Changing the model to meet demands. *Journal of Adolescent Health*, 15, 549-557.
- (1995). Full service schools: Revolution or fad? *Journal of Research on Adolescence*, 5, 147-172.
- Dryfoos, J. G., Brindis, C., & Kaplan, D. W. (1996). Research and evaluation in school-based health care. *Adolescent Medicine: State of the Art Reviews*, 7, 207-220.
- Durlak, J., & Wells, A. (1997). Primary prevention mental health programs for children and adolescents: a meta-analytic review. *American Journal of Community Psychology*, 25, 115-152.
- Eakin, E. (2000). Review of primary care-based physical activity intervention studies: effectiveness and implications for practice and future research. *Journal of Family Practice*, 49, 158-168.
- Elders, J. (1992). School-based clinics to the rescue. *School Administrator*, 49, 16-18, 20-21.
- Elias, M., Kress, J., Gager, P., & Hancock, M. (1994). Adolescent health promotion and risk reduction: cementing the social contract between pediatricians and the schools. *Bulletin of the New York Academy of Medicine*, 71, 87-110.
- English, A. (1993). Early and Periodic Screening, Diagnosis, and Treatment (EPSDT): A model for improving adolescents' access to health care. *Journal of Adolescent Health*, 14, 524-526.
- Ensign, J., & Santelli, J. (1998). Health status and service use: comparison of adolescents at a school-based health clinic with homeless adolescents. *Archives of Pediatrics & Adolescent Medicine*, 152, 20-24.

Evans, S. W. (1999). Mental health services in schools: utilization, effectiveness, and consent. *Clinical Psychology Review*, 19, 165-178.

Evidence for Policy and Practice Information Coordinating Centre (EPPI-Centre) (2000). *A review of the effectiveness and appropriateness of peer-delivered health promotion interventions for young people*. London: Institute of Education Social Science Research Unit, University of London.

Fisher, M., Juszczak, L., Friedman, S. B., Schneider, M., & Chapar, G. (1992). School-based adolescent health care. Review of a clinical service. *American Journal of Diseases of Children*, 146, 615-621.

Formigli, V. L., Costa, M. C., & Porto, L. A. (2000). Avaliacao de um servico de atencao integral a saude do adolescente (Evaluation of a comprehensive adolescent health care service) [Portuguese]. *Cadernos de Saude Publica*, 16, 831-841.

Fothergill, K., & Ballard, E. (1998). The school-linked health center: a promising model of community-based care for adolescents. *Journal of Adolescent Health*, 23, 29-38.

Fothergill, K., & Feijoo, A. (2000). Family planning services at school-based health centers: findings from a national survey. *Journal of Adolescent Health*, 27, 166-169.

Freed, L., H., Ellen, J. M., Irwin, C. E., & Millstein, S. G. (1998). Determinants of adolescents' satisfaction with health care providers and intentions to keep follow-up appointments. *Journal of Adolescent Health*, 22, 475-479.

Gall, G., Pagano, M. E., Desmond, M. S., Perrin, J. M., & Murphy, J. M. (2000). Utility of psychosocial screening at a school-based health center. *Journal of School Health*, 70, 292-298.

Graham, M. V., Uphold, C. R., Blakeslee, D. J., Gibbons, R. B., & Barnes, M. M. (1992). Program evaluation of a school-based clinic: one method of demonstrating effectiveness. *Journal of Nursing Care Quality*, 7, 70-79.

Guernsey, B. P., & Pastore, D. (1996). Comprehensive school-based health centres: implementing the model. *Adolescent Medicine: State of the Art Reviews*, 7, 181-196.

Hacker, K. A., Weintraub, T. A., Fried, L. E., & Ashba, J. (1997). Role of school-based health centers in referral completion. *Journal of Adolescent Health*, 21, 328-334.

Harden, A., Weston, R., & Oakley, A. (1999). A review of the effectiveness and appropriateness of peer-delivered health promotion interventions for young people. *Evaluation of Health Promotion and Social Interventions*, 1-180.

Hedberg, V. A., Byrd, R. S., Klein, J. D., Auinger, P., & Weitzman, M. (1996). The role of community health centers in providing preventive care to adolescents. *Archives of Pediatrics & Adolescent Medicine*, 150, 603-608.

Hedberg, V. A., Klein, J., & Andresen, E. (1998). Health counseling in adolescent preventive visits: effectiveness, current practices and quality measurement. *Journal of Adolescent Health*, 23, 344-353.

Hippisley-Cox, J., Allen, J., Pringle, M., Ebdon, D., McPhearson, M., Churchill, D., & Bradley, S. (2000). Association between teenage pregnancy rates and the age and sex of general practitioners: cross sectional survey in Trent 1994-7. *BMJ*, 320, 842-845.

Iglehart, V. R., Conner, D., & Sinnette, C. H. (1977). A comprehensive school health program in Harlem: a retrospective view. *Journal of School Health*, 47, 88-93.

Jaggs, W. K. (1998). A community-based health centre for adolescents: A case study. *International Journal of Adolescent Medicine & Health*, 10, 19-26.

- Jennings, J., Pearson, G., & Harris, M. (2000). Implementing and maintaining school-based mental health services in a large, urban school district. *Journal of School Health*, 70, 201-205.
- Kaplan, D. W. (1995). School-based health centers: primary care in high school. *Pediatric Annals*, 24, 192-3; 197-200.
- Kaplan, D. W., Brindis, C. D., Phibbs, S. L., Melinkovich, P., Naylor, K., & Ahlstrand, K. (1999). A comparison study of an elementary school-based health center - Effects on health care access and use. *Archives of Pediatrics & Adolescent Medicine*, 153, 235-243.
- Kapphahn, C., Wislon, K., & Klein, J. (1999). Adolescent girls' and boys' preferences for provider gender and confidentiality in their health care. *Journal of Adolescent Health*, 25, 131-142.
- Kirby, D. (1991). School-based clinics: research results and their implications for future research methods. *Evaluation and Program Planning*, 14, 35-47.
- (2001). *Emerging answers - research findings on programs to reduce teen pregnancy: summary*. Available from: <http://www.teenpregnancy.org/>. Washington, DC.: National Campaign to Prevent Teen Pregnancy:
- Kisker, E. E., & Brown, R. S. (1996). Do school-based health centers improve adolescents' access to health care, health status, and risk-taking behavior? *Journal of Adolescent Health*, 18, 335-343.
- Klein, J. D. (2000). Adolescents, health services, and access to care. *Journal of Adolescent Health*, 27, 293-294.
- Klein, J. D., Wilson, K. M., McNulty, M., Kapphahn, C., & Collins, K. S. (1999). Access to medical care for adolescents: results from the 1997 Commonwealth Fund Survey of the Health of Adolescent Girls. *Journal of Adolescent Health*, 25, 120-130.
- Klein, J. D., Woods, A. H., Wilson, K. M., Prospero, M., Greene, J., & Ringwalt, C. (2000). Homeless and runaway youths' access to health care. *Journal of Adolescent Health*, 27, 331-339.
- Kubiszyn, T. (1999). Integrating health and mental health services in schools: psychologists collaborating with primary care providers. *Clinical Psychology Review*, 19, 179-198.
- Leaf, P. J., Alegria, M., Cohen, P., Goodman, S. H., Horwitz, S. M., Hoven, C. W., Narrow, W. E., & et al. (1996). Mental health service use in the community and schools: Results from the four-community MECA study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35, 889-897.
- Lear, J. G. (1996). School-based services and adolescent health: past, present and future. *Adolescent Medicine: State of the Art Reviews*, 7, 163-180.
- Lurie, N., Bauer, E. J., & Brady, C. (2001). Asthma outcomes at an inner-city school-based health center. *Journal of School Health*, 71, 9-16.
- Morone, J., Kilbreth, E., & Langwell, K. (2001). Back to school: a health care strategy for youth. *Journal of Health Affairs*, 20, 121-136.
- Nader, P. R. (2000). Health promoting schools: why not in the United States? *Journal of School Health*, 70, 247.
- Newcomer, S., Duggan, A. & Toczek, M. Do school-based clinics influence adolescent birth rates? In: Mundigo, A. (Ed.) *Reproductive health: programme and policy changes post-Cairo*. Liege, Belgium: International Union for the Scientific Study of Population.
- North Health (1996). *Youth health - service contracts for North Health*. Auckland: North Health.

- O'Donnell, L., Stueve, A., Doval, A. S., Duran, R., Haber, D., Atnafou, R., Johnson, N., & et al. (1999). The effectiveness of the Reach for Health Community Youth Service learning program in reducing early and unprotected sex among urban middle school students. *American Journal of Public Health*, 89, 176-181.
- Perez, R., Patience, T., Pulous, E., Brown, G., McEwen, A., Asato, A., Hume, R., & Calhoun, B. C. (1998). Use of a focussed teen prenatal clinic at a military teaching hospital: model for improved outcomes of unmarried mothers. *Australian & New Zealand Journal of Obstetrics & Gynaecology*, 38, 280-283.
- Perry, C. S., & Toole, K. A. (2000). Impact of school nurse case management on asthma control in school-aged children. *Journal of School Health*, 70, 303-304.
- Rones, M., & Hoagwood, K. (2000). School-based mental health services: a research review. *Clinical Child & Family Psychology Review*, 3, 223-241.
- Ruminski, D., & Klink, H. (1993). School-based health centers: A model for delivery of adolescent health care in Portland, Oregon. *Journal of Ambulatory Care Management*, 16, 29-41.
- Sanci, L. A., Colley, C. M. M., Veit, F. C. M., Carr-Gregg-M., Patton, G. C., Day, N., & Bowes, G. (2000). Evaluation of the effectiveness of an educational intervention for general practioners in adolescent health care: randomised controlled trial. *BMJ*, 320, 224-230.
- Santelli, J., Morreale, M., Wigton, A., & Grason, H. (1996). School health centers and primary care for adolescents: a review of the literature. *Journal of Adolescent Health*, 18, 357-366.
- Symons, C. W., Cinelli, B., James, T. C., & Groff, P. (1997). Bridging student health risks and academic achievement through comprehensive school health programs. *Journal of School Health*, 67, 220-227.
- U.S. Congress - Office of Technology Assessment (1991). *Adolescent health - Volume I: summary and policy options*. Washington D.C.: US Government Printing Office.
- U.S. General Accounting Office (1994). *Health care: school-based health centers can expand access for children. Report to the Chairman, Committee on Government Operations, House of Representatives*. Washington, DC: General Accounting Office.
- U.S. National Adolescent Health Resource Center (1994). *Summary and recommendations from a study of selected high school wellness centers in Delaware: executive summary*. Available from: <http://www.cyfc.umn.edu/newyouth/IF1006.html>. Minneapolis: University of Minnesota
- Valois, R. F., & Hoyle, T. B. (2000). Formative evaluation results from the Mariner Project: a coordinated school health pilot program. *Journal of School Health*, 70, 95-103.
- Walker, Z. (1999). The role of general practice in promoting teenage health: a review of the literature. *Family Practice*, 16, 164-172.
- Wilson, K. M., & Klein, J. D. (2000). Adolescents who use the emergency department as their usual source of care. *Archives of Pediatrics & Adolescent Medicine*, 154, 361-365.
- Witt, J. C., Vanderheyden, A., & Penton, C. (1999). Prevention of common mental health problems among adolescents. National and local best practices in school-based health centers. *Journal of the Louisiana State Medical Society*, 151, 631-638.
- Young, T. L., D'Angelo S, L., & Davis, J. (2001). Impact of a school-based health center on emergency department use by elementary school students. *Journal of School Health*, 71, 196-198.

Appendix 5

NEW ZEALAND STUDIES IDENTIFIED THAT WERE NOT INCLUDED IN THE APPRAISAL OF NEW ZEALAND LITERATURE

Bennett, S., & Coggan, C. (1999). *A comprehensive evaluation of the mentally healthy schools initiative*. Auckland: Injury Prevention Research Centre, University of Auckland.

Central Health (1998). *Formative evaluation of the youth one stop shops in the central region*. Wellington: Central Health.

Clendon, J., & White, G. (2001). The feasibility of a nurse practitioner-led primary health care clinic in a school setting: a community needs analysis. *Journal of Advanced Nursing*, 34, 171-178.

Coggan, C., & Disley, B. (1996). *Youth health community action programme: formative evaluation report*. Auckland: Injury Prevention Research Centre, Department of Community Health, University of Auckland.

Murdoch, J. C., & Silva, P. A. (1996). The use of general practice services by 18 year olds in New Zealand. *New Zealand Medical Journal*, 109, 113-115.

New Zealand. Ministry of Youth Affairs (1998). *Under one roof: a review of one stop shop health services for young people in New Zealand*. Wellington: Ministry of Youth Affairs.

North Health (1996). *Youth health - service contracts for North Health*. Auckland: North Health.

Rimmer, M., & Jury, A. (1999). *Youth one stop shop review*. Wellington: Health Funding Authority.