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*"Research That Makes a Difference"*

# The Detection and Management of Pre-diabetes in General Practice: A study of current practices, capacity, and feasibility

## **Final Report**

November 2006

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# 1 Preface

This is the final report of the research study “Diabetes Prevention for Patients with Pre-diabetes in Australian General Practice” conducted by the UNSW Research Centre for Primary Health Care and Equity (CPHCE), University of New South Wales with funding from the SAX Institute.

## 1.1 Research investigators

The SAX Institute funded the University of New South Wales through CPHCE to conduct this study. The investigators from CPHCE were Professor Mark Harris, Ms Cheryl Amoroso, Professor Nicholas Zwar, Dr. Suzanne McKenzie, Dr. Qing Wan, and Mr. Gawaine Powell Davies. Investigators from collaborating organisations were Dr. Megan Passey and Ms. Lisa Barnett (Northern Rivers University Department of Rural Healths), Mr. Ross O’Donoaghue (NSW Health), and Associate Professor Gaynor Heading (University Department of Rural Health, Broken Hill, Sydney University).

## 1.2 Acknowledgements

The investigators for this project would particularly like to thank the following people/organisations for their contribution to this study:

- The St George Division of General Practice
- The General Practitioners, South East Sydney Area Health Service employees, and community and private referral service staff that took part in interviews
- The general practice patients who took part in the focus groups
- The two general practices and their patients that took part in the intervention and the evaluation
- Sue Kirby for her work on the patient surveys
- Sarah Ford, Administrative Assistant, CPHCE

## 1.3 Ethics approval

Ethics approval for this project has been obtained from the University of New South Wales Human Research Ethics Committee (Approval No. HREC05179).

## 1.4 Aim of the research

The aim of this research is to examine the feasibility of improving the screening for and management of pre-diabetes in urban Australian general practice. This report details the findings from pre-intervention interviews and focus groups, as well as detailing the intervention put in place, and reporting post-intervention interview and survey findings.

## 2 Main Messages

Guideline-driven opportunistic pre-diabetes screening can be supported through GP education, raising patient awareness and an increased focus on prevention. There is a need however for nationally agreed screening guidelines for pre-diabetes.

Guideline-driven management of pre-diabetes can be supported through clinician education, guideline provision, appropriate referral pathways and an increased focus on prevention.

There is scope for non-GP staff to support screening and management of pre-diabetes.

Significant increases in clinicians' recording of risk factors and improvements to the information technology systems supporting this will be required to enable at-risk patients to be called into their general practice for diabetes/pre-diabetes screening and for the recall of patients with pre-diabetes.

A major to the management of pre-diabetes is a lack of affordable and appropriate diet and physical activity referral services, therefore the capacity to manage existing pre-diabetes patients should be addressed concurrently with supporting practices to increase detection of pre-diabetes.

Alternate models of referral should reviewed or tested for effectiveness and acceptability for this high risk population due to the prevalence of pre-diabetes, current availability of services, and the lack of subsidies for referral for these patients. Alternatives to traditional referral, such as co-location of allied health staff and/or greater roles for practice nurses should also be explored.

Group pre-diabetes lifestyle referral was well-received and utilised by patients and GPs, but some patients also expressed a need for more individualised tailoring of programs.

Divisions of General Practice have a significant role to play in supporting practices to manage pre-diabetes, especially the establishment of information systems, identification of staff roles and in negotiating arrangements for referral of patients at high risk of developing diabetes.

Disseminating this intervention to other general practices will need to consider local service models and capacities.

## **3 Executive Summary**

### **3.1 The existing problem**

Type 2 diabetes is a significant cause of illness, hospitalisation and mortality in Australia, with approximately 100,000 Australians developing type 2 diabetes each year<sup>1</sup>. One in six Australians over the age of 25 have pre-diabetes<sup>2</sup> (impaired glucose tolerance or impaired fasting glycaemia), where a person has blood glucose levels that are higher than normal, but not high enough to be diagnosed as diabetes. People who have pre-diabetes are at particularly high risk of developing type 2 diabetes, however diabetes can be prevented or delayed in many of these cases with changes to diet and physical activity. Pre-diabetes is detected using the same screening process as for diabetes, although diagnostic conditions and resulting management differ. The feasibility of preventing type 2 diabetes in Australian general practice is unknown, although research suggests that many opportunities to screen high risk patients and to manage pre-diabetes may be missed.

### **3.2 Aim of the research**

The aim of this study is to determine the current practices, capacity and feasibility of screening for and managing pre-diabetes in an urban Australian general practice setting in order to prevent the onset of type 2 diabetes.

### **3.3 What did we do?**

This study was conducted in partnership with the St George Division of General Practice, an urban Division in Sydney, NSW. The study focused first on examining current practices, barriers, areas for improvement, and feasibility with regard to screening for and management of pre-diabetes in general practice in the St George area. Interviews were conducted with GPs, South East Sydney Area Health Service employees from health promotion, community nursing, and a hospital-based diabetes centre and nutrition centre, providers of private diet and physical activity referral services, community physical activity providers, and Division staff.

The second phase of the research was planning and implementing a three month pilot intervention to improve screening for and management of pre-diabetes in two general practices.

The third phase of the study was the assessment of the intervention. Interviews were conducted with general practice staff, referral and support services, and patients regarding outcomes, experiences, and lessons learned from the intervention.

## **3.4 What did we find?**

### **Before the Intervention**

The key findings from interviews and focus groups are summarised below:

#### **Screening**

Diabetes screening in the general practices is done opportunistically, and is not consistent with guidelines, with the most common screening barriers being GPs not remembering to screen, and patient inconvenience related to the testing procedure, particularly with regard to the under-use of the oral glucose tolerance test. Practice information technology systems do not have the capacity to provide recalls for patients at-risk of diabetes, although patients were supportive of the idea.

#### **Guideline use**

GPs were unclear about the evidence for preventing diabetes in patients with pre-diabetes, as well as how to screen for, diagnose and manage pre-diabetes. GPs often did not follow the guidelines for screening for diabetes/pre-diabetes, and currently there is no national pre-diabetes guideline.

#### **Referral**

Referral was very rarely offered for patients with pre-diabetes. Lack of accessible, affordable and appropriate referral services that GPs were aware of were the main barriers. The St George area currently has no capacity for pre-diabetes to be addressed in the public system or via population health. Some community-based exercise services were available, however they were not commonly used by GPs. Additionally private services were unaffordable for most of the patients in the area, and Enhanced Primary Care item rebates are generally not available for these patients. The suggestion was made that referral relationships could be strengthened by the facilitation of meetings between GPs and service providers.

#### **Education**

GPs expressed some reluctance at using the term “pre-diabetes” with patients in case it overly concerned them, and patients in focus groups were unsure of what pre-diabetes meant. Succinct pre-diabetes patient education information is lacking, and not all GPs were aware of the limited existing resources. Additionally the practices identified a role for nurses in diabetes prevention, however it was not part of their role at the time, and some practices that would have liked nurses to be involved with this saw them as unaffordable for practices to employ. Patients in focus groups agreed that GPs have limited time, and were accepting of education provided outside of the practice in addition to GP-provided education and written materials.

### **After the Intervention**

An intervention based on supporting the practice to improve the screening for and management of pre-diabetes was developed and implemented. This intervention

included GP training, pre-diabetes guidelines, the development of a Division-run pre-diabetes referral group, directories, and patient waiting room risk screening. The key findings from the post-intervention interviews and patient survey are summarised below:

### **Screening**

Patient waiting room risk assessment surveys were useful in assisting GPs to remember to screen, integrate prevention opportunistically into consultations and provide an opportunity to raise diabetes risk awareness with patients.

### **Guidelines**

According to interviews with GPs, the development and distribution of guidelines for the screening and management of pre-diabetes led to an increase in evidence-based practice. Although training and the experience gained during the intervention persuaded most doctors to use the oral glucose tolerance test more frequently when clinically indicated, patient inconvenience remained as a significant barrier to using this.

### **Education**

Training on motivational interviewing provided in the intervention was reported to be useful by GPs, although some reported that it was difficult to motivate patients. Although GPs felt confident in the pre-diabetes education they provided to patients, at the start of the referral program, many of these patients were unsure what pre-diabetes was and if they had it and were not aware that conversion to diabetes could be prevented or delayed through lifestyle change.

### **Referral**

A Division-run lifestyle program for patients with pre-diabetes was well-received by GPs and patients, with 18 referred into the 4 week program, and 15 attending, overcoming the largest barrier to referral, which was a lack of accessible services. Pre-diabetes education for GPs addressed the barrier of GPs perceiving referral for pre-diabetes as unnecessary, however did not eliminate it. Both patients and the referral service providers thought the Division Lifestyle program needed at least a fifth week and additional follow-up.

### **Unresolved issues**

The current general practice reimbursement system lacks incentives for GPs and nurses to provide preventive care. The current Enhanced Primary Care items do not reimburse patients who incur expenses from allied health referrals if they do not have a complex chronic illness. Public services are currently unable to support chronic disease prevention objectives due to current structure, objectives, and funding.

## **3.5 Implications**

There are opportunities for Divisions of General Practice to support practices to provide intervention to high risk patients in order to prevent diabetes. Activities

which serve to educate patients about diabetes risk, how to prevent diabetes, and the importance of diabetes testing will help to decrease patient barriers to screening. GP and nurse education on the evidence for and best methods of intervening for patients with pre-diabetes is needed. Also required is clinician training that enhances skills and confidence in addressing behavioural risk factors, and motivating patients, while working with them to establish changes in lifestyle.

The availability of public services has a significant impact on the decision to refer patients with pre-diabetes. Therefore if pre-diabetes is to be managed effectively, publicly provided or reduced cost services need to be supported, particularly in more disadvantaged communities. In considering cost effectiveness, alternative models to private one on one consultations with allied health providers should be considered. Further investigation should be done into the acceptability, effectiveness, and cost of group programs and other models in this circumstance.

The current system of remuneration for GPs and practice nurses, as well as rebates for patients should be examined, as they are currently not supportive of chronic disease prevention. The 45 year old health check will provide an opportunity to identify patients with pre-diabetes, however the lack of funding for referral services may reduce the impact of this on the prevention of diabetes in general practice.

## 4 Context

Each year, approximately 100,000 Australians develop type 2 diabetes<sup>1</sup>, making it a significant cause of illness, hospitalisation and mortality in Australia. One in six Australians over the age of 25 have pre-diabetes<sup>2</sup> (impaired glucose tolerance (IGT) or impaired fasting glycaemia (IFG)), where a person has blood glucose levels that are higher than normal, but not high enough to be diagnosed as diabetes. Pre-diabetes is a strong risk factor for developing type 2 diabetes.

Large, population-based studies in China, Finland and USA have recently demonstrated the feasibility of preventing, or delaying, the onset of diabetes in overweight subjects with pre-diabetes. The studies suggest that even moderate reduction in weight and only half an hour of vigorous walking each day reduced the incidence of diabetes by more than one half. In the Da Qing trial in China, diet and physical activity interventions in people with IGT were associated with a 42% reduction in diabetes incidence over 6 years<sup>3</sup>. Randomised controlled trials (RCTs) in the US<sup>4</sup> and Finland<sup>5</sup> have both demonstrated reductions in the incidence of type 2 diabetes of 58% over 3 years in people with IGT who received intensive individualised diet and physical activity programs compared with control groups. Health economic studies in US, NZ, Australia<sup>6</sup> have demonstrated cost utility of intervening in these high risk patients.

The feasibility of comprehensive screening for type 2 diabetes and pre-diabetes, as well as pre-diabetes management in Australian general practice is unknown. The evidence so far comes from RCTs with intensive, highly resourced interventions, and there is need to test the implementation of these interventions in real world settings. The AusDiab study demonstrated that only half the people found to have type 2 diabetes had previously been diagnosed with diabetes<sup>7</sup>. Even capturing those with diagnosed diabetes can be difficult. Using 16 Division registers the DDCQIP data showed that the mean coverage of the estimated number of patients with diabetes attending participating GPs,<sup>i</sup> increased from 20.9% (SD 12.4) in 2000 to 38.0% (SD 20.3) in 2002.

In response to the development of a national framework for implementation of behavioural risk factor interventions in general practice<sup>8</sup>, the NSW SNAP trial was conducted in two divisions of general practice with their associated Area Health Services. The evaluation demonstrated that a multi-strategy approach involving practice visits, education, resource provision and linkages with referral services could bring about changes to the organisation of general practice and the reported assessment and delivery of behavioural interventions<sup>9</sup>. The trial SNAP Trial has generated a number of resources and assisted in the development of the RACGP SNAP guide<sup>10</sup>.

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<sup>i</sup> Based on the age and sex distribution of the division population and AusDiab age and sex specific prevalence rates).

There are a number of steps involved in the prevention of type 2 diabetes in people with pre-diabetes. These include:

*1. Identifying and recruiting high risk groups for screening.*

The NHMRC Guidelines have identified at risk groups which should be targeted for screening for type 2 diabetes and pre-diabetes<sup>11</sup>. These include:-

- All adults 55 years of age and over
- People aged 45 years and over who have at least one of the following:
  - Body mass index (BMI) greater than 30
  - Hypertension
  - First degree relative with diabetes
- People aged 35 years and over from the following ethnic backgrounds:
  - Aboriginal and Torres Strait Islander
  - Pacific Islander, Indian subcontinent, Chinese
- People with clinical cardiovascular disease (myocardial infarction angina or stroke)
- Women with previous gestational diabetes
- Women with polycystic ovary syndrome who have a BMI greater than 30.

*2. Screening*

In accordance with NHMRC guidelines, screening for diabetes/pre-diabetes involves a fasting blood glucose test followed by a glucose tolerance test for those in the appropriate range. If the fasting blood glucose is between 6.1 and 6.9, a glucose tolerance test should be performed. This will identify further cases of diabetes, as well as allow the GP to distinguish between IGT and IFG. A diagram in Appendix A illustrates the diagnostic criteria.

*3. Intervention / Referral*

Experience from the international diabetes prevention trials is that the interventions should be intensive and aim for patients to:

Achieve and maintain a weight loss of 7%

Increase moderate physical activity to 150 minutes per week

Modify their diet so that they receive no more than 30% of their calories from fat (and less than 10% saturated fat), and increase fruit and vegetable intake.

These interventions may be delivered in 6-8 education sessions over several months.

*4. Follow up*

Patients need to be followed up at the conclusion of the intensive intervention and then every 3 months for the first year and yearly thereafter. At yearly follow up they should be tested with a fasting blood sugar.

## 5 Aim of Research

The aim of this study was to determine the feasibility of screening for and managing pre-diabetes in urban Australian general practice. This involved determining the current practices, capacity, and barriers and enablers for screening for and managing pre-diabetes in general practice, implementing an intervention to improve evidence-based care, and evaluating the intervention.

Research Questions:

- What interventions and support can improve the diabetes/pre-diabetes screening rates?
- What are patients' views on diabetes/pre-diabetes screening?
- What proportions of patients with pre-diabetes are referred to and attend diet and physical activity programs?
- What can improve referral and attendance rates to diet and physical activity programs?
- What is the current capacity of community and allied health services to meet the referral demand?
- What proportion of patients with pre-diabetes attend follow up visits with their GP?
- What is the Division/AHS role in supporting pre-diabetes screening and management?

## 6 Method

### 6.1 Setting

This study was conducted in the St George area of Sydney with the support of the St George Division of General Practice, an urban Division in NSW. The St George Division has 255 GP members from 135 general practices. Most significantly when compared to the rest of Australia, the area has an ageing population (15.6% are aged 65+) and has a large non-English speaking background with 36.5% of the population born overseas<sup>12</sup>. The complete Population Health Profile Report for the St George area is included in Appendix B.

### 6.2 Pre-intervention needs assessment

#### **Interviews with health care providers and Area Health Service managers**

The interviews were developed by the investigators, and piloted with three currently practicing academic general practitioners, and one policy-level AHS employee. The pilot interview schedule was reviewed for length, clarity of questions, and comprehensiveness of the information collected. As a result of piloting, a copy of the diabetes screening guidelines was provided to all interview participants at the start of

the interview. No major changes were made to the interview structure or questions after piloting. The final versions of the pre-intervention interviews are included in Appendices C and D. The interviews took between 20 and 40 minutes to administer, and participating GPs received a \$50 payment for a half hour of their time, in line with the Division's protocol.

Interviews were conducted with GPs, South East Sydney Area Health Service employees, providers of public and private diet and physical activity referral services and Division staff. Recruitment of GPs was done through the Division's newsletter. The newsletter advertisement sought GPs who were interested in participating in research with the University of New South Wales regarding pre-diabetes. All responding GPs were contacted regarding taking part in an interview, and were provided with a study information sheet. Area Health Service departments relevant to the research study were also approached. The Community Health Unit, Health Promotion Unit, Nutrition Centre, and Diabetes Centre located in the St George public hospital were all contacted and agreed to take part. An appropriate manager-level staff member was invited to participate in an interview and provided with a study information sheet. To recruit private, public and community-based diet and physical activity services, a search was done via dietician and exercise physiology accreditation boards, as well as through the yellow pages. All referral service practitioners and organisations were contacted via phone and posted information sheets regarding the study. Division staff members who were involved in chronic disease, diet and physical activity interventions were approached to participate in the same manner. Data collection and analysis for the pre-intervention interviews is detailed in section 6.5.

### **Patient Focus Groups**

The focus group questions were developed by the investigators based on key areas of interest and are included in Appendix E. The aim of the focus group was to ascertain patients' previous knowledge and perceptions regarding pre-diabetes, the acceptability of diabetes/pre-diabetes screening and the management of pre-diabetes, and preferred types of diet and physical activity support. Two evening focus groups of one and a half hours were held, with patients able to select their preferred evening. The facilitator providing a brief explanation of the purpose of the evening prior to commencement of the group, and each participant received \$30 in compensation at the conclusion of the focus group for any costs associated with attending.

Focus group participants were recruited through practices with participating GPs. A sign was placed on the reception desk in each of the practices, and a flyer was placed beside it with the details of the focus group and to sign up they needed to phone the research fellow at the University who was coordinating the study. The only requirement for participating in the focus group was that the person was 45 years or older and was a patient of the practice. This criteria was established because this would allow the following mix of patients:

- aged 45-54 with no risk factors, do not yet meet diabetes screening criteria
- aged 45-54 with at least one risk factor, meet diabetes screening criteria
- aged 55+, all of whom meet diabetes screening criteria

Patients were not excluded if they had diabetes or pre-diabetes, and patients were informed that the group discussion would be about chronic disease prevention, screening and behavioural risk factors. Data collection and analysis is detailed in section 6.5.

### **6.3 Development and implementation of the intervention**

The second phase of the research was planning and implementing a three month intervention in two general practices to improve screening for and management of pre-diabetes. The details of the intervention are contained in the results section, as development of this was based on the first stage of the research. The intervention was planned by the study's management committee based on the information collected from the interviews and focus group participants.

Two practices were approached to participate in the intervention. It was preferred that one small and one large practice would participate, and one solo practice that was involved in the phase 1 interviews was invited to take part. A practice with four GPs and two nurses was identified by the Division, and was provided information regarding the research project and invited to participate.

Patient involvement in the trial entailed receiving pre-diabetes management care from the GP, which may or may not include referral to other services, as well as receiving a survey regarding their experience at their general practice, any referral services they attended, and attempted and achieved change in their behavioural risk factors. Patients were recruited into the research study if they had received a diagnosis of pre-diabetes within the past year and had not received a referral for diet or physical activity since the diagnosis. To recruit patients, GPs could recall those with pre-diabetes to the practice or invite them opportunistically as they presented. Patients were provided with the patient information sheet and consent form, and if they chose to participate the signed consent form was collected by the researcher along with their contact details. Non-identifying information was collected from the non-participants in the form of gender, age, diagnosis of IFG or IGT, and if they were from a non-English speaking background.

The costs involved with implementing the intervention were estimated based on expenses incurred during the trial.

## **6.4 Evaluation of the intervention**

### **Provider interviews**

The third phase of the study was the assessment of the intervention. An interview schedule was developed and piloted by the investigators for use with GPs, practice staff and referral providers (Appendices F and G). These in-person interviews took approximately 30 minutes to conduct and related to outcomes, experiences, and lessons learned from the intervention. These interviews were conducted with all clinical staff participating in the trial, and the two allied health professionals who ran a referral service.

### **Patient surveys**

A patient survey was developed to be used with all consenting patients that had been recruited into the study (Appendix H). The purpose of this tool was to collect information on the education that they received from their practice, if they had recently attempted to and/or succeeded in making lifestyle changes, and their experience with diet or physical activity services if they were referred. All patients who consented to take part in the study received the survey. Patients were surveyed by mail two weeks after the conclusion of the intervention period.

## **6.5 Data collection and analysis**

All interviews and focus groups were taped with permission for the participants. The tapes were then professionally transcribed verbatim, and checked for accuracy by the researcher. Notes were taken during interviews and focus groups, and included in the analysis. The same data analysis approach was used to analyse the focus groups, pre-intervention interviews, and post-intervention interviews. The analytical approach used followed that of Thematic Analysis, with the researcher producing a code list of broad themes from the data relating to the objectives of the research and the interview questions. The interview and focus group data were then re-examined to classify further data which were related to these themes, and emerging sub-themes were established. Codes were then reviewed for duplication and clarity, and edited accordingly. Throughout the analysis, emergent themes were added to the coding framework to ensure completeness. The coding was developed and crosschecked by a second researcher. Qualitative analysis was supported with the computer software program QSR NVIVO2.

Closed ended patient survey questions were analysed quantitatively using SPSS, while the free text responses were analysed thematically.

## 7 Results

### 7.1 Pre-Intervention needs assessment

Invitation to all GPs in the Division resulted in expressions of interest from five GPs located in four practices, who all took part in pre-intervention interviews. Also participating in interviews were three private dietitians, a private exercise physiologist, a diabetes education centre manager, a public dietitian, a community health manager, three employees from the Division of General Practice, and two health promotion officers. All of these service providers who were approached agreed to participate. Two patient focus groups were held, with 10 participants attending one group and 8 attending the other.

The results are presented here for screening and management with regard to current practice, barriers to systematic screening encountered, and strategies for improvement diabetes screening.

#### 7.1.1 Current screening method

Diabetes screening in the general practices was conducted opportunistically. No GPs interviewed were using recall or reminder systems for people who required screening for diabetes, including those with pre-diabetes. The decision to screen patients was made as patients presented, and it was normally the GP who raised the issue.

Random blood tests were also used in place of fasting blood glucose by some GPs, with convenience for the patient cited as the reason. Where nurses were available in practices, they would do diabetes/pre-diabetes testing, predominantly the random blood glucose test. Abnormal random blood glucose tests were then generally followed up with fasting blood glucose tests.

The dietitians and exercise physiologists reported occasionally sending patients back to their GP to be tested for diabetes if they felt that it was indicated and it had not been undertaken. The GP was seen as the coordinator of the patient's care, and there was a concern on the behalf of the referral service providers to not overstep boundaries, ensuring that the GP remains a willing partner in the management of subsequent patient care.

*" I actually write a letter to the GP, or get the doctor on the phone in the consult. ..We've actually got the facility here to actually order blood tests where the patient privately pays. I'm reluctant to do it often because if I have already approached the GP to double check a few things, by doing a glucose tolerance test with insulin levels if we do find that they're in that category of possible treatment, we want the doctor to be awaiting [to provide care to the patient] " Private dietitian*

The community health nurses generally were not very involved in chronic disease prevention activities, as the majority of their patients have chronic conditions, however it was expressed that they would probably like to do more preventive work, but currently it does not fit in well with the other demands on their time.

### **7.1.2 Barriers to diabetes screening**

Barriers to diabetes/pre-diabetes screening included a lack of adherence to guidelines, prioritisation of preventive work, time, resources for recall and reminder systems, and GP and patient understanding of pre-diabetes. Other screening barriers were patient inconvenience, and a perception of minimal benefit of detecting pre-diabetes.

#### **Guideline awareness and adherence**

In interviews, GPs discussed their methods for identifying people at risk for diabetes, which were often not in accordance with the screening guidelines. Screening obese people with no other risk factors at younger ages than recommended, neglecting to screen the high risk ethnic groups at the clinically indicated younger ages, and generally being unclear on which ages to begin screening were common. In some of these cases the GPs were aware of the guidelines but disagreed with them.

*“I personally wouldn't put an age restriction because pre-diabetes can be seen in mid-twenties. ...I think the age has to be omitted because in the real life I see children who have you know obesity...they eat unhealthy and they have first degree relatives with diabetes ... they are in greater risk for diabetes and they should not be outside the guidelines. I think the guidelines are a bit probably 50 years ago. I think it can be broader than this prevention programme from just looking at it because I mean I should read this guideline but I don't. I just call on commonsense.” GP*

Methods of diabetes screening did not always correspond with guideline recommendations. Some GPs relied on the nurse doing a random blood sugar test when a fasting blood sugar test was indicated, while most did not perform the oral glucose tolerance test after the fasting blood glucose when it was guideline-indicated.

Patient focus groups believed the general practice to be the most appropriate service to offer diabetes screening, and public screening in locations such as shopping malls or the chemist were not appropriate because the person providing the screening was not aware of the medical history. One of the GPs suggested that to take the pressure off the practices, pre-screening could be offered at the chemist, and people could be recommended to attend the practice to be screened.

#### **Competing demands of acute care focus**

A barrier to screening encountered was remembering to do it when patients presented, and juggling the importance of diabetes and prevention with other competing issues.

*“Oh, I should have a reminder notice here on my desk - 'this patient could have diabetes'. And all the other things you've got to try and think about. Because I mean, the other day, and now I've got to think about psychosis in all young people presenting.” GP*

*"I think it probably wouldn't be managed well because you're adding on top of my current (work), and I'm sure at some point it's just going to fall apart." GP*

While it was acknowledged that community health nurses want to be more involved in identifying patients who were at risk of diabetes for screening, constraints on their time and the current structure of their work do not allow this.

### **Lack of time**

Time was a commonly listed barrier for GPs, other service providers, and patients with regard to systematic diabetes screening. Pressures on the time of GPs and public allied health workers reduced opportunities to perform preventative work, and create a more reactionary and acute-focused environment. Diabetes screening was also more difficult to implement when patients had multiple other problems to address in the consultation.

*"Again it comes down to time, yeah. And again, I think you go through phases where you're very good at adding in all these extra bits, particularly when you're doing care plans for patients. A lot of that tends to get put in. But again that's not across the board." GP*

### **Knowledge of pre-diabetes**

Some GPs needed clarification regarding what conditions are defined as pre-diabetes, and patients were uncertain about the term as well. There was also reluctance from some GPs and other health professionals to use 'pre-diabetes' with patients, due to concern that labelling them with this would cause confusion or make them overly concerned.

*"What worries me is making such a big issue of it that people-the stress and the rest of it that comes with identifying people-there's a whole other element to this that needs to be addressed as well as in terms of people's mental health and what such a disease focus can create." Areas Health Service- Health Promotion*

### **Patient inconvenience**

The degree to which patient inconvenience was perceived to be a barrier varied greatly between GPs. Most of the GPs did not state any specific patient barriers with regard to patients attending for a fasting glucose test, or expressed that there were no patient barriers. However some of the GPs felt that this was very inconvenient for some patients, and one of the GPs offered random blood glucose tests frequently due to the inconvenience. Most of the GPs felt that the glucose tolerance test was very inconvenient for patients due to the two hour wait at the pathology lab, and most were reluctant to order these tests for patients, while others did not order them at all.

Patient focus groups indicated that inconvenience was not enough of a barrier to cause them to not attend the diabetes screening, particularly if their GP thought it was important.

### **Perceived benefit**

Another potential barrier to diabetes screening raised was the availability of resources and capacity to manage any detected pre-diabetes. If the GP perceived that detecting pre-diabetes does not provide an advantage with regard to preventing diabetes, then it is less likely to be considered an important goal, but rather make the GP feel ineffective.

*“comprehensive screening would be better, but what would be, if I screen and identify 25 patients with pre-diabetes yet I have no resources to help them? What would their outcome would be?” GP*

Additionally GPs may not be convinced that the potential benefit of pre-diabetes detection outweighs the risk of potential harm to the patient from being identified.

### **Resources for recall/reminder systems**

Time was a frequently mentioned barrier to running a recall and reminder system for diabetes. In addition to not having the time to set up and run the system, their incompleteness of the risk factor recording in the medical records and the computer software program would not be able to support a register based on the NHMRC screening guidelines. There was reluctance by one GP to establish a recall system, as she recognized the amount of work that would be required in maintaining complete registers and contacting patients.

*“Oh, I’m just a solo GP and I just can’t be sending letters to people, I just, it’s not going to happen.” GP*

Two kinds of registers and recall systems were discussed; one which includes all people at risk of diabetes who require a recall for screening, and another which includes all people that have pre-diabetes and require ongoing management. There were more barriers for creating and maintaining screening registers. With regard to registers that list all people at risk, age was an accurately recorded patient variable, while ethnicity, BMI and family history were not, and many software programs do not support the creation of this type of register. While age was reliably recorded for patients, BMI and conditions such as polycystic ovary or heart disease were sometimes recorded, and ethnicity and family history were either not recorded or not searchable by the computer software.

## **7.1.3 Strategies to increase diabetes screening**

Strategies to increase systematic and guideline-driven screening for diabetes included improved data management, better use of practice nurses, GP reminder systems, and raising patient awareness.

### **Data management**

Issues regarding time and completeness of data need to be addressed in order to successfully implement recall and reminder systems. It was suggested that the Division could be involved here in supporting the practices to be able to do this, thus reducing the barriers of time and completeness of data. With regard to time,

delegation of recall and reminder-related tasks to other practice staff was one suggested option.

A staff member from the Division believed that the GPs are generally moving towards the level of systemization required for reminder and recall.

*"It's growing. It is. The GPs are wanting that knowledge now (to do recalls). It's just a progression. You know once they get over accreditation and computerisation and everything else it's coming to this and seeing more and more that doctors are now ready and their practice staff are willing to take on that responsibility which is really good so it's a growing area and one that hopefully in the next year we'll be able to tighten up even more." Division staff*

### **Practice nurses**

Practice nurses were acknowledged as potentially having a role in the identification of at-risk patients via thorough patient histories, although nurses were not undertaking these activities at the time of the interviews. Other GPs were interested having nurses in the practices who were involved in disease prevention, but either did not see hiring a nurse as financially viable or did not have sufficient space for them.

*"well, if I had a practice nurse, I would possibly involve the practice nurse in gathering more information before [I see the patient], but [currently] I take all the history myself, so really it's up to me to ask the right questions." GP*

### **GP awareness and reminders**

Desktop reminders and electronic pop-ups were suggested as strategies to remind GPs to consider if the patient requires diabetes screening. There was however recognition that providers becoming fatigued with these and may turn them off. Other strategies to increase GP awareness were through professional education events.

### **Patient awareness**

Patient awareness of the risk of diabetes and importance of diabetes screening was identified as a strategy to increase guideline-driven screening. It was suggested that this be done via messages delivered to the general population, as well as in the general practice. Other strategies included waiting room questionnaires or education materials that could prompt the patients to raise the issue of screening in the consultation as well as serve to remind GPs to be looking for people who fit the screening criteria.

*"I've got a sign on the door telling people about blood sugars and how they should be checked. Everybody's heard of cholesterol, but not everybody's heard about the risk of diabetes, so I've been telling them about it, and through my newsletters, your health newsletters, they get to read articles about that." GP*

#### **7.1.4 Pre-diabetes management current practice**

The most frequent intervention for patients with pre-diabetes was GP-provided brief lifestyle advice, with walking the most commonly suggested activity. No GPs

mentioned using motivational interviewing techniques, including assessing the patient's readiness to change.

Referral to diet and physical activity programs was rare for patients with pre-diabetes. With regard to private referral, many GPs indicated that their patients did not have private insurance and would be unable to afford to attend. The St George area did not have any exercise physiologists at the time of this study, and although community physical activity groups were not often used by the GPs interviewed, there was capacity for SHARE, an area health service-funded community physical activity organization, to provide more group services. Both patients and GPs expressed a wish for referral services with a range of formats, including both individual and group sessions, as preferences differ based on personal situation.

The GPs interviewed did not provide active follow-up for patients with pre-diabetes in a systematic way. In a practice that had nurses who managed the recall, the GPs said that it would be easy to have pre-diabetes patients recalled, although this was not setup to occur at the time.

### **7.1.5 Barriers to pre-diabetes management**

Barriers relating to pre-diabetes management that were addressed a lack of patient and GP awareness, patient motivation, appropriate patient education materials, accessible public services, time, and capacity to manage non-English speaking patients.

#### **Patient awareness**

Health professionals viewed the lack of patient awareness regarding pre-diabetes and diabetes prevention as a barrier to patients being involved in active management of their lifestyle risk factors. Additionally this issue was complicated due to the lack of illness or obvious health effects for patients who are diagnosed with pre-diabetes.

*"I suppose I think the barriers are basically people are not aware of ...risk. Health risk are not perceived as important as other risks...people might be symptom free and this doesn't mean that they're healthy. The message that absence of symptoms does not equal it's not equal to health. It has to be sort of worked on." GP*

#### **GP pre-diabetes awareness and guidelines adherence**

In interviews GPs also expressed uncertainty about the appropriate management for patients with pre-diabetes, and most GPs were unfamiliar with the evidence supporting intervening with these patients. Most GPs, when managing these patients provided some advice, but did not ask the patient to return for follow-up.

#### **Patient education materials**

A lack of patient education materials that were appropriate for people with pre-diabetes was noted by both GPs and allied health service providers. Health service

providers that were interviewed had sometimes found pre-diabetes difficult to explain to patients, and this was complicated further by then providing patients with education materials targeted for patients with diabetes.

While there were minimal printed education materials on pre-diabetes, many GPs and allied health professionals were not aware of the pre-diabetes info sheet produced by Diabetes Australia. It was stressed that a variety of resources were needed in order to provide the patient with the level of detail most appropriate to their situation. Language was also identified as a barrier, with no pre-diabetes materials in the foreign languages commonly encountered in the local area.

### **Availability of public referral services**

Significant barriers existed to GPs being able to refer patients to diet and physical activity services in the St George area. The public system that provided referral services for diabetes education was overstretched with regard to providing services in the area for patients with diabetes, and did not accept patients with pre-diabetes. With regard to public dietetic services, the dieticians were unable to offer more outpatient appointments due to a lack of time because of acute care demands, and there was a six week waiting list with minimal spaces available for patients from general practice. It was acknowledged that if evidence-based pre-diabetes management were to be adopted on a greater scale in the area, GPs would be unable to rely on these services.

### **Patients from non-English speaking backgrounds**

Language and culture were barriers to managing pre-diabetes in the St George Area, which has a high population of people from non-English speaking backgrounds. Access to patient education that is in other languages was lacking, or was difficult for GPs to access when it was needed. Attendance at referrals is also problematic due to language barriers, although some GPs had experience arranging translators for referral services.

### **Patient motivation**

Patient motivation was a major barrier to GPs and other health service professionals managing patient risk factors. A lack of personal motivation and personal responsibility for lifestyle risk factors was considered one of the key determining factors for behaviour change in patients.

### **Time**

GPs, other service providers, and patients acknowledged that GPs do not often have the time needed to address behavioural risk factors to the extent necessary for diabetes prevention on their own. GPs also noted that additional consultations were often needed to deal with the lifestyle issues, primarily because the reason for the patient booking the consultation needed addressing.

*"I do try and do it then. I really do. I mean, if you've got a waiting room full of people and things are really, you're really pressed for time at that point, then obviously you can't and you just have to say 'look, I really think you've got a lot of other issues that need addressing and I recommend you come back when I've got time to sit down and go through all this with you.' And most people accept that, but of course they may not come back, and you've missed the opportunity." GP*

### **7.1.6 Strategies to improve diabetes management**

Strategies to improve diabetes management included involving other practice staff and co-located staff, obtaining appropriate patient education materials, management guidelines attached to pathology reports, GP education on stages of change, and provision of referral services.

#### **Practice staff and co-located staff**

There is potential for practice nurses to be involved in pre-diabetes management; providing lifestyle interventions, discussing and arranging appropriate referral options with patients, and arranging patient follow up at the practice.

*"I think they can definitely be involved here in identifying patients that need screening, with the screening, the recall of getting them back, and just with the motivation in regards to making some positive changes with their diet and with their exercise." GP*

*"We have to treat people who are symptomatic, who have urgent medical needs and certainly prevention requires time and commitment and obviously it's a lot of time consuming being a sole practitioner. One of the things we are short of is time. I think in the future for the general practice I think we should be allowed a dietician to visit general practices and we to have separate sessions where we [refer]patients where we can't help." GP*

*"I'll be happy to provide space, time and I'll assist on appointments but yes we need services to come to us rather than we to send patients away." GP*

It was mentioned in several interviews that having co-located allied health services may assist in the managing of pre-diabetes. This situation however was not seen as viable by one private dietician.

*"In actual fact that's hard to do (co-location) because other GPs won't send to another surgery...that's why we tend to be in specialist rooms because they're seen as being independent." Dietician*

#### **Patient education**

Suggestions to improve diet and physical activity patient education materials were to collated and provided to GPs in a useful format. Additionally more pre-diabetes specific materials need to be developed and distributed. In many cases this would require only minor changes to the existing diabetes information sheets, particularly removing mention of the reader having diabetes-specific symptoms and medications. These information sheets should also include information on what diabetes is, as many of the focus group participants were unclear on the specifics of the disease.

## **Pathology**

Another strategy raised by a Division staff member and GP was to involve pathology companies, having them attach a document to pre-diabetes results which highlight appropriate management for GPs to undertake.

## **Readiness to change**

GP time and limited referral resources may be most effectively used if GPs assess patients' readiness to change, and try to motivate the patients if they are in the pre-contemplation stage before sending them to the referral service. If diet and physical activity referral is available, it may be best for the GP to provide brief advice, while the allied health professional provides more in-depth information.

*"In terms of lifestyle intervention, where I see the primary care physician playing the greatest role is in encouraging the pre-contemplators and the contemplators, or using certain strategies to motivate patients to advance to the next stage. There are some physicians who may be able to provide the total management of the patient in the sense of overseeing them for the whole lifestyle intervention ... But in the constraints of the average GP consultant... there's ample time for them to implement proven successful strategies to advance patients to the next stage. And that's probably where a referral network with an allied health professional would be ... very beneficial, because then the health professional takes over from when the patient is at preparation stage, and ready to go through and make the lifestyle change." Ex Physiologist*

## **Referral services**

The lack of appropriate and affordable referral services was one of the greatest barriers to providing evidence-based management for pre-diabetes. Strategies to overcome this were based on the provision of services of a high quality which were appropriate and inexpensive to which they could send patients with pre-diabetes. The format of the sessions was less important than having the service provided by a trusted and capable provider. A pre-diabetes specific group was seen as a solution to this problem, with this type of service taking pressure off the GPs to try to explain pre-diabetes and provide information on diet and physical activity within the timeframe of the consultation.

*Oh that'd be great (a pre-diabetes education group), because again it comes down to time. You know, it's time that you spend with them versus someone who's trained in doing that and knows all the stuff and has all the stuff. I'd send them along. GP*

## **7.2 The Intervention**

In consideration of the above findings and implications, an intervention to increase screening for and management of pre-diabetes was put into place in two general practices in the St George area between April and July of 2006. The two practices were a solo GP practice, and a practice with four GPs and two practice nurses. All GPs and nurses participated in the intervention, without any loss of practice participants during the study.

This intervention included:

- The development and distribution of a waiting room diabetes risk survey. All patients over age of 35 were asked to complete the survey and show it to their GP during the consultation to prompt a screening discussion.
- Electronic versions of English and foreign language diet and physical activity patient education, which were sorted by language. Also included was the Diabetes Australia pre-diabetes information sheet (available in English only).
- A directory of private, public, and community physical activity services in the local area was provided.
- A pre-diabetes guideline was developed and distributed to GPs and practice nurses.
- An education session on pre-diabetes and motivational interviewing was provided for GPs and practice nurses.
- Printed NHMRC screening guidelines were provided for the desktop.
- Training in the Lifescrpts lifestyle prescription resources
- Electronic diabetes screening reminders were activated in the medical software.
- A 4-session group diet and physical activity referral service for people with pre-diabetes was developed with the St George Division of General Practice.

During the study, 33 patients were identified as fitting the criteria (recent diagnosis of pre-diabetes), 26 patients consented to take part in the trial (79%), and 18 enrolled in the Division referral program, of whom 15 attended the program. The 4 week Division referral program did not have any people drop out of the classes once they had attended. Two patients were referred to private providers in addition to the Division referral program, and 1 patient was referred to a public service only.

### **7.2.1 Costs**

The cost of the intervention was estimated based on provision costs and pre-diabetes referrals generated during the three months of the trial's intervention period. This was then extrapolated to calculate the costs if it was rolled out to all 255 GPs from the 135 practices in the Division, assuming that the practices would average out to similar referral rates of 8 patients per practice over three months.

### Cost of intervention if delivered to all GPs and practices in the St George Division

Item	Description	Cost
Division staff time	Organising intervention services (30hrs), 1hour visit to 135 practices (140 hours), organising training (30 hrs) @ \$40 per hour	200 hours @ \$40/hr = <b>\$8000</b>
Referral Service	Education session venue, dietician facilitator (2 hours), exercise physiologist facilitator (2 hours), patient handouts, administration time, physical activity venue, physical activity facilitator (4 hours)	1080 patients @ \$90/patient = <b>\$97,200</b>
Travel	Travel to practices	135 practices @ \$30/practice = <b>\$4050</b>
Communications	Fax and telephone	135 practices @ \$5 = <b>\$675</b>
Training	Catering, venue, facilitators and actors for Motivational Interviewing Training	255 GPs @ \$700 per 20 GPs = <b>\$8925</b>
Resources	CDs, Directories, Guidelines	255 GPs @ \$7 /GP = <b>\$1785</b>
<b>TOTAL COST</b>		<b>\$120,635</b>

## 7.3 Post intervention provider interviews

The overall response of the GPs, practice staff, and referral service providers to the intervention was positive. The most useful aspects of the intervention were identified as the Lifestyle Sessions referral service that was run by the division, the GP and nurse education session on pre-diabetes and motivational interviewing, and the patient waiting room risk survey. The intervention appeared to have broadly overcome many of the barriers. Brief case studies were produced for each of the practices based on the information provided by the GPs and practice staff in the interviews and can be found in Appendices I and J.

Issues arising during the post intervention interviews regarding the support received for screening and managing pre-diabetes are described below.

### 7.3.1 Pre-diabetes screening

Screening issues arising during the post-intervention interviews were GP and patient awareness, use of the oral glucose tolerance test, patient education materials, and motivational interviewing.

### **Patient awareness**

Patient waiting room risk assessment surveys were useful in assisting GPs to remember and integrate prevention opportunistically into consultations and provided an opportunity to raise diabetes risk awareness with patients. These were seen as useful because the patient often entered the consultation prepared to discuss diabetes after having completed the risk survey.

### **GP awareness and education**

GP training and distribution of the screening guidelines also had an impact on the screening of patients, with some shifting their focus to include more patients in the risk categories. Some of the GPs felt strongly that screening should occur at younger ages than guidelines recommend because these patients could also benefit from intervention, and stated that once those in the risk categories were receiving appropriate screening, the younger patients would be again screened. The electronic and paper-based screening reminders were useful for some of the GPs, however the screening reminder programmed into the clinical software does not reflect current screening guidelines.

### **Oral Glucose Tolerance Test**

GP education regarding the screening for diabetes had an impact for some GPs with regard to ordering the oral glucose tolerance test. Three of the GPs who began using the test regularly on patients who had a fasting blood glucose test within the clinically-indicated range detected a total of four patients who had diabetes, which otherwise would have been undiagnosed. This example was a strong motivator for these GPs to continue to use the oral glucose tolerance test, although they still perceived patient inconvenience to be a large barrier. Overall there was much less resistance from patients than GPs predicted, particularly if the test was explained to the patient during the consultation.

*"[The OGTT] clarifies things a bit and it probably is worth the extra effort although you have a little bit of resistance in ordering it on everyone that's just 5.7, you know there because it is extra you know inconvenience, cost and all that but I suppose having done it though it does clarify things and this girl it did clarify that she actually is truly diabetic and therefore we've got to do something...It probably still has some question marks but it's a bit of a big ask to get them to do a two hour but I think, I think I'm being convinced that it is probably is worth doing. I'm taking it more seriously."*  
GP

*"[The OGTT] is a big onus. It would be good if we could not have to go to the glucose tolerance test because that's such a time consuming thing" .GP*

### **Motivational Interviewing**

Training on motivational interviewing and assessing readiness to change was identified as one of the most useful aspects of the intervention for GPs. They did, however find motivating patients who were not yet in the stage of contemplating change to be to be very difficult.

*"I didn't persuade anyone, you know. I didn't motivate, I didn't. I just screened and offered and explained what the benefits would be, but I couldn't engage people...I think there were a large*

*number of patients to whom I didn't deliver the benefits because I didn't have the time to manage them, the multi-factorial health issues, their sort of living problems." GP*

### **7.3.2 Pre-diabetes management**

Pre-diabetes management issues arising from the interviews related to a changed approach and attitude to management, addressing issues relating to patients from non-English speaking backgrounds, referral services, and patient follow-up.

#### **Attitude change**

Following the intervention, all participating GPs reported that they were more pro-active in the management of patients with pre-diabetes. While previously it was not a condition that received much attention, participation in the study provided education regarding the evidence behind managing pre-diabetes, as well as clear clinical guidelines. One GP audited past case notes, finding in her patient population, most patients with pre-diabetes had progressed to diabetes before receiving more aggressive management. Another GP described his change in approach:

*"certainly I had this attitude, that those people with an impaired fasting glucose level just needed some watching over the years and period of time rather than active intervention and the study obviously emphasised that one could stop patients becoming frankly diabetic just by intervening early and I suppose that was not a concept that we vigorously pursued before this." GP*

*"We've been talking about it more and I must admit I've been a bit better at telling people that they've got to look at that area I've probably underemphasised it before saying great you're not diabetic but I probably haven't been emphasising look you're 5.5 to 7 and you're in the range that could bring on to trouble, I've been emphasising that a bit more." GP*

#### **Patient education**

Several of the GPs who had indicated that had previously been concerned about how patients would react to the term pre-diabetes stated that they believed those fears to have been unfounded. The GPs did not encounter any excessive concern from patients regarding

#### **Non-English speaking background**

The foreign language resources provided as part of the intervention were not used by the GPs, and several GPs did not remember receiving them. It was mentioned that future patient education resources may be more useful if they are better integrated into GPs existing systems for storing and retrieving patient information handouts. Significant barriers to managing patient with pre-diabetes who have limited English remain. Closer coordination with organisations such as the Multicultural Resource Centre or the Multicultural Health Communications Centre, NSW Health was suggested by a Division staff member as potentially alleviating some barriers due to culture and language.

#### **Referral**

A Division-run lifestyle program for patients with pre-diabetes was well-received by GPs and patients, with 18 referred into the four week program from the two practices,

and 15 patients attending; overcoming the largest barrier to referral, which was a lack of services. GPs stated a confidence in the program because it was provided by health professionals who were known to them from the Division. Referrals to other services were used for three patients, two of whom also attended the lifestyle program. The training for GPs on pre-diabetes addressed the barrier of some GPs perceiving referral for pre-diabetes as unnecessary, however did not eliminate it. One of the five GPs did not identify or refer any patients to the program and said:

*"I think realistically you would try and get them to do the exercise that they can do.... and looking at their diet rather than necessarily sending them straight off [to a referral service] because of the logistics of that. There are twice as many pre-diabetics as there are diabetes then I think ... maybe they have the less intensive treatment of encouraging them to walk and following them up and encouragement that way but things that they can do themselves and maybe change their lifestyle whereas if they then get to the stage where they're not doing it and subsequent glucose levels are showing that there's a worsening of the situation or whatever then maybe a referral would be needed down the track but say not as the initial thing because of the logistics of it." GP*

### **Follow-up**

GPs indicated that after the intervention, they asked patients with pre-diabetes to return for follow-up appointments with more frequency than previously. Both patients and the referral service providers thought the Division Lifestyle program needed a fifth week and additional follow-up. It was suggested by one of the service providers that a follow-up by phone a month or two after the program would be ideal, however time may be a barrier to doing this. In a few cases the referral service provider had noticed additional issues that would need follow-up with the GP, and a letter was provided to GPs to inform them of these issues.

### **7.3.3 Post Intervention Patient Survey**

The response rate to the survey was 58%, with 15 of the 26 patients returning the survey. Of the 15 responding patients, 10 were referred to the Division-run Lifestyle program, and of these 10, one was also referred to a private dietician and one was also referred to a private exercise physiologists. One patient was referred to a public exercise physiologist, and four were not offered referral.

### **Patient Education**

Half of the patients responded that they had been told that they had pre-diabetes, while most patients were aware that they were at increased risk of diabetes. Most of the patients reported having received information from their GP or practice nurse on how they could decrease their chance of getting diabetes. Patients indicated that information provided either by GPs or practice nurses was helpful and easy to understand.

### **Changes to Lifestyle**

Most patients reported that they had achieved their planned changes to diet, which included trying to have more regular meals, being more aware of what they were

eating, eating low GI foods, increasing cereals, reducing portion size and dietary fats, and decreasing alcohol consumption. All of the patients who aimed to make changes to their diet indicated that they had made changes.

Most patients indicated that they planned to make changes to their physical activity, including using resistance training, joining a gym, increasing motivation, and walking regularly. Less than half of the patients who aimed to make changes to their physical activity were able to achieve changes.

Although most patients reported that they had achieved the planned changes to diet, and a few has increased physical activity, only the minority of patients had achieved weight loss.

### **Barriers**

The only reported barriers to attending the Lifestyle program was the time that sessions were offered, circumstances such as school holidays occurring during the scheduled program, and distance to the location for patients who did not live in the St George area. The major barrier to attending private referral was cost.

### **Suggested improvements to referral program**

Several patients would have preferred the Division-run Lifestyle program to run for a longer period so that they could have enough time to break old habits and establish new routines.

*"I would of like more sessions so you can have someone following your progress & helping you to get into a good pattern of exercise and diet - I don't feel it was long enough"*

Participants made the following suggestions to improve the nutrition education:

*"would be more helpful if it also told you how to eat when you're a shift worker"*

*"Having regular sessions to help confirm you are going okay and advice on easy meals to prepare that are good for you"*

*" it all made sense but it becomes hard when you go out a lot and boring with food choices"*

With regard to improving the physical activity component, one participant commented on how this could have been improved by more individual attention:

*"I am fairly active and found the classes too easy which was okay because I know they had to cater to the other people but I would of liked someone to talk to me individually telling me how I could improve my physical activity like with weights and even going through it with me - the guy said he would but was caught up with other people"*

Issues that made it difficult to follow the physical activity advice included not having enough individual guidance, negative personal attitude, the fast pace of the program, and work interfering with attempts to increase activity.

*"Having a program to follow but not from a gym just one you could follow at home. Learning how to take your pulse properly and generally understanding as you get older what exercises are best so you don't get injuries."*

Most patients indicated that they would not be willing to pay for individual private consultations with an exercise physiologist or a dietician. More than half of the patients were willing to go to various combinations of diet and physical activity groups, with group diet education sessions the most popular option.

*“very happy all round. However I would like to see a dietician”*

### **Follow up**

Most of the patients reported that their GP recommended that they attend the practice for a follow-up visit. At the time of the survey, which was one week after the end of the program, half of the patients had attended their GP for a follow up pre-diabetes visit.

### **Intervention acceptability**

Patients valued the information provided but would have preferred more time devoted to individual work. In general, the session times were well accepted, as there was a choice between day or evening sessions, with more patients choosing the evening session.

The following are some of the comments made by participants:

*“the idea of the program is good but the facilitator needs training in how to facilitate a group”*

*“The program is well conducted. The information provided made me aware my life style and the effect diabetes may have on my life”*

There were indications that participants would sustain their changed lifestyle

*“Pity only four weeks - at this stage I want to join an activity exercise group but I am not sure what sort would suit me. I will join something at a gym when I return from overseas in October”*

*“It’s harder to diet and exercise when you’re working full time and teenage boys to look after. Will be retired end of year so will concentrate on diet and exercise”*

## **8 Discussion**

The aim of this study was to examine the feasibility of screening for and managing pre-diabetes in general practice. This study was conducted on a small scale, and aimed to identify issues for GPs and patients which may arise if this were to be done on a larger scale

### **8.1 Methodological limitations**

While a case study approach is a strength with regard to understanding fine details and real world issues, small samples limit generalisability. The study should therefore be seen as raising issues which may need further investigation. The availability of referral services and the capacity of the Division also needs to be considered in the generalisation of this study to other areas. In particular, the findings should not be considered generalisable to rural and remote settings, and it needs to be recognised that the practices involved in this small study were self-selected and likely to be more motivated to undertake preventive work.

### **8.2 Process issues arising from the study**

The study raised a number of issues relating to the viability of addressing diabetes prevention through general practice. The main issues and possible solutions are described below.

#### **8.2.1 Screening process**

##### **Guidelines**

GPs expressed uncertainty about the clinical definition of pre-diabetes, and its screening criteria and management. Currently there are no Australian pre-diabetes guidelines. Standard nationally-distributed guidelines would help address this uncertainty by providing a common reference point for GPs and other service providers and provide an authoritative source of materials for those such as Divisions who may provide support for diabetes prevention in general practice.

##### **Reminders**

GPs identified remembering to screen for diabetes and pre-diabetes as difficult due to competing demands and priorities. Reminders in the practice can be used to encourage the uptake of screening guidelines, including electronic reminders, desktop copies of screening criteria, and waiting room diabetes risk surveys that patients bring in to the consultation. These strategies can raise the profile of diabetes prevention, increase familiarisation with the criteria and promote diabetes prevention as a focus of health care in the practice. For increased effectiveness, the pre-programmed Medical Director screening reminder should be altered to reflect current screening guidelines.

### **Appropriate tests**

GPs are concerned about the inconvenience to patients of the oral glucose tolerance test. Patients however expressed willingness to have these tests if considered necessary by the doctor. Further exploration of the acceptability of these tests to patients is needed to clarify this issue and education of GPs about the importance of screening may help overcome their reluctance to request the test.

## **8.2.2 Management process**

### **GP training/Motivational interviewing**

Patient motivation was a barrier to providing management for pre-diabetes, and GPs expressed a lack of confidence in motivating patients to change their behaviour. Training in motivational interviewing was well received by the GPs, with a high level of interest in the topic reported. Some GPs had increased confidence in addressing behavioural change, although it was indicated that within the timeframe of the consultation, it was still difficult to use the skills they learned to motivate pre-contemplative patients. Even if GPs do not feel confident in motivating patients, by assessing readiness to change they can make better use of limited referral services by ensuring that patients who are ready to change receive priority for referrals. This training could be specific to diabetes prevention, or it might be part of more general risk factor management and behaviour change training in the practice.

### **Referral**

There was a shortage of referral options for patients at high risk of diabetes, and GPs were not fully aware of those options that existed. This indicates a need to develop more effective referral systems. This is likely to involve supporting the development of services or programs as well as ways of ensuring that GPs are aware of them and creating straightforward referral systems. To improve access, lower cost alternatives to individual private allied health consultation should be considered. This trial showed that group education was acceptable to GPs, patients and providers, however the effectiveness of this compared to individual support is unknown.

Referral is particularly important for this group of patients. Their high risk of chronic disease makes behaviour change particularly urgent, but lacking a chronic condition, they cannot receive subsidised referral services, and they are often younger than the target range for many community services. The pressure for accessible and appropriate services will increase if there is more widespread screening for and detection of pre-diabetes.

There are potential advantages with regard to cost and streamlining of systems in providing services which address risk factors more broadly, for example providing weight management sessions as opposed to pre-diabetes sessions. However, in the

trial, being provided with a specific diagnosis was a strong motivating factor for lifestyle change, and group dynamics benefited from all participants having the same condition. An introductory session explaining what pre-diabetes and diabetes are, and the evidence behind being able to prevent them, was particularly important given that many of the patients did not have a good understanding of this or know that they had pre-diabetes. Adopting a broader format would therefore need further consideration in light of these issues.

With regard to GPs accessing services, systems should be arranged so that GPs can be made aware of appropriate community, private and public services that are available. In this trial, GPs cited that having a program that was run by the Division put them at ease with regard to the quality of service that was being provided. Divisions may also have a role in providing and brokering services, facilitating face to face meetings between referral providers and GPs and assessing the quality of services that are provided. Because these services are also required for a range of professionals outside of general practice, planning a network or information system that is not exclusive to general practice should be considered. Alternatives to external referral of patients, such as an enhanced role for a practice nurse, or co-location of allied health practitioners, should also be considered.

### **Recall systems**

Practices currently do not have the capacity to reliably identify and recall patients who are at risk of diabetes and require screening. Registers and recall systems can provide the information required for a systematic approach to identifying and following up patients with pre-diabetes. However current GP clinical management software does not support such functions. A diabetes risk register would need to include searchable fields for the relevant risk factors and for pre-diabetes, and would depend upon a more systematic recording of patient histories by GPs. As with other registers, practice staff could be delegated the non-clinical tasks associated with managing the register and recall system.

## **8.3 Capacity for diabetes prevention**

Prevention is one of many things competing for GP attention in a time-pressured setting. Strategies are needed to highlight and support prevention activities for both GPs and nurses. One way of supporting prevention is through incentives such as the recent Division indicators, or through funding preventive activities in general practices, or providing incentives for nurse to up-skill and take on roles in lifestyle behaviour change.

The recent MBS item for the 45 year old preventive health check begins to address this issue of supporting prevention in general practice. This item, however, only addresses part of the issue: it supports GPs by remunerating them for a long

consultation for risk factor screening and management, but it does not address the need for affordable and appropriate referral services or for follow up health checks.

In this study 32 patients with pre-diabetes and generated 16 new referrals of patients with pre-diabetes from two practices over a three month period. If this was generalised to the whole Division, this would equate to 2160 pre-diabetes patients identified and 1080 pre-diabetes referrals generated in three months. The number of patients identified as having pre-diabetes in this study was less than anticipated based on population estimates. Reasons for this may include previous interventions for people with pre-diabetes, insufficient screening of presenting patients, or reluctance of patients. Additionally the practices both relied on opportunistic screening. Had more systematised screening via targeted recalls been feasible, the number of patients identified and thus requiring referral would have increased.

However, at the level of referral which occurred from the two practices, the workload was possible for the Division program and private services to manage. If screening were implemented more systematically and across more of the Division's practices, additional low-cost referral services would need to be developed or brokered.

## **8.4 Barriers and facilitators for diabetes prevention**

The study identified a wide range of barriers and facilitators for GPs and practices taking part in the trial. The following tables below summarises these and suggests potential solutions (some of which were carried out in the intervention) and well as identifying remaining issues.

<b>Problems and solutions regarding identification of at-risk patients and diabetes screening</b>			
<b>Problems</b>	<b>Solutions within practices</b>	<b>Solutions outside of the practice</b>	<b>Remaining issues</b>
GPs have many acute issues that need to be managed in the consult, and may not remember to think prevention in the consult	Patient waiting room risk survey – This educates patients, as well as helps build opportunistic screening into regular practice	Public education regarding who should be tested for diabetes and why it is important  Improved reminders developed for medical software	Public education more likely to reach patients with greater capacity. More disadvantaged patients will rely more on GP initiative for screening
Patient inconvenience for fasting blood glucose test	Order fasting blood glucose and cholesterol tests simultaneously	Public education and awareness regarding diabetes testing  Research regarding patient acceptability of FBG test	
Patient inconvenience of oral glucose tolerance test	Patient education sheet on the OGTT	Public education and awareness regarding diabetes testing  Research regarding patient acceptability of OGT test	The 2 hour wait for OGTT is inconvenient, may need to negotiate something more streamlined for practices regarding referral and reporting results.
GP belief that oral glucose tolerance test is unnecessary	Training for GPs on evidence-based diabetes screening		Need to feedback to GPs on patients who had IFG and were found to have diabetes because of the OGTT
Practice may not have the capacity to address prevention with all patients at-risk of diabetes	Screen only patients who fit the guideline criteria, reaching those at the highest risk	Develop more referral services	

<b>Problems and solutions regarding identification of at-risk patients and diabetes screening</b>			
<b>Problems</b>	<b>Solutions within practices</b>	<b>Solutions outside of the practice</b>	<b>Remaining issues</b>
GP belief that detecting pre-diabetes will have little patient benefit	Training for GPs on pre-diabetes management and recent research	Improve access to affordable referral for pre-diabetes	
GP uncertainty around pre-diabetes parameters and screening procedure	Training for GPs on pre-diabetes screening  Use of pre-diabetes guidelines	Inclusion of pre-diabetes management in nationally available guidelines  Pathology reports for patients with results indicating IGT or IFG range indicating next steps according to evidence-based guidelines	Inconsistency between clinical guidelines

<b>Problems and solutions regarding management of pre-diabetes</b>			
<b>Problems</b>	<b>Solutions within practices</b>	<b>Solutions outside of the practice</b>	<b>Remaining issues</b>
Lack of clarity regarding how to manage pre-diabetes and the effectiveness of management	<p>Training for GPs on managing pre-diabetes and the current evidence behind intervention</p> <p>Use of pre-diabetes guidelines</p>	Inclusion of pre-diabetes management in nationally available guidelines	Vocational training for GPs and RNs
Poor understanding or uncertainty regarding what referral services provide	Improve referral letters to and communication with service provider	<p>Division assistance with arranging events where GPs meet providers</p> <p>Improve feedback from referral services to GPs</p> <p>Co-located allied health services</p> <p>Directory of public private and community based services distributed and kept up to date</p>	Clarification needed of roles of referral staff

<b>Problems and solutions regarding management of pre-diabetes</b>			
<b>Problems</b>	<b>Solutions within practices</b>	<b>Solutions outside of the practice</b>	<b>Remaining issues</b>
Limited referral resources	<p>GP training in identification of stages of change to make best use of resources</p> <p>Increase referrals to community programs</p>	<p>Division assists in providing low cost referral services</p> <p>Changes to MBS rebates, allowing these patients access to reduced fee private allied health</p> <p>Increase in availability of public dieticians and exercise physiologist outpatient appointments</p> <p>Changes to resourcing and structure of diabetes education centre, allowing pre-diabetes patients to be referred there for education</p>	<p>What is the appropriate mix of public and private services which result in equity of access especially for those at moderate risk?</p>
Limited access to up to date patient info sheets	<p>Improve systems of filing or electronically storing patient education sheets for easier access</p> <p>Make use of the Diabetes Australia pre-diabetes information sheet</p>	<p>Availability in appropriate languages</p>	<p>Consistency of information contained in foreign language resources</p>

<b>Problems and solutions regarding management of pre-diabetes</b>			
<b>Problems</b>	<b>Solutions within practices</b>	<b>Solutions outside of the practice</b>	<b>Remaining issues</b>
Lack of appropriate follow-up for patients with pre-diabetes	<p>Develop practice recall system for pre-diabetes or add pre-diabetes to existing recall system</p> <p>Recall system for re-testing which eliminates need to see GP for test and results</p>	Software development	
Non-English speaking patients	Use of foreign language patient education materials	Establishment of referral groups for particular ethnic and language backgrounds	
Lack of time to manage behavioural risk factors (and pre-diabetes)	<p>Increase use of referral for education</p> <p>Involvement of practice nurse in patient education</p> <p>Systematic follow-up to provide additional intervention</p>		

## 9 Implications

This study has shown that practices can be supported to increase guideline-driven pre-diabetes screening and management and that GPs will refer to, and patients will attend, referral for this if the services are appropriate and accessible. In order for this to be applied on a sufficiently wide scale to make an appreciable difference to the incidence of diabetes, several things are needed:

- an increased focus on prevention, supported by appropriate payment systems
- improved practice systems and extended roles for practice staff
- wider availability of appropriate and affordable referral services, supported by better information systems

While some of these can be addressed by extending current activities, such as Division roles, the issue of referral services in particular is likely to require a re-think of the types of service that are appropriate for risk factor and pre-diabetes management, the referral arrangements and information system that will support these, and the extent to which such arrangements can be shared between general practice and other services which are helping address risk factors (eg community health).

Screening rates for diabetes can be increased if practices are provided with support, particularly through GP education and patient awareness, particularly if practices prioritise prevention activities, record risk factors, and use recall systems for screening. Increasing detection of pre-diabetes alone will not impact on the burden of diabetes, therefore if increasing detection, the capacity for practices to provide management of these patients within the practice and via referral services must not be neglected.

Pre-diabetes management that occurs within the practice is also feasible with support, provided that the GPs and practice view chronic disease prevention as a priority. In supporting practices to manage pre-diabetes, Divisions could play a significant role in arranging appropriate GP education, assisting practices to obtain relevant patient education materials, providing a link between referral services and GPs, and working to fill gaps regarding accessible services. Pre-diabetes management using referral was only made feasible in this trial through the Division providing a low-cost service for people with pre-diabetes.

A lack of access to referral services when required may negatively impact on GPs perception of their effectiveness and ability to change behavioural risk factors in patients, which may in turn affect the motivation to work towards systematic diabetes screening. It is therefore suggested that the capacity to manage existing pre-diabetes patients be addressed prior to or concurrently with supporting practices to increase detection of pre-diabetes. While new initiatives such as the 45 Year Old Health Check MBS item provide consultation time for GPs to screen for and manage risk factors in the practice, this study indicates that without further support and accessible referral, preventive care for high risk patients will be difficult to implement.

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# Appendices

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**A** Diabetes/Pre-diabetes testing parameters

**B** Population Health Profile of St George District Division  
of General Practice

**C** Pre-intervention interviews with GPs

**D** Pre-intervention interviews with other health service  
providers and AHS managers

**E** Pre-intervention patient focus group questions

**F** Post-intervention GP interview

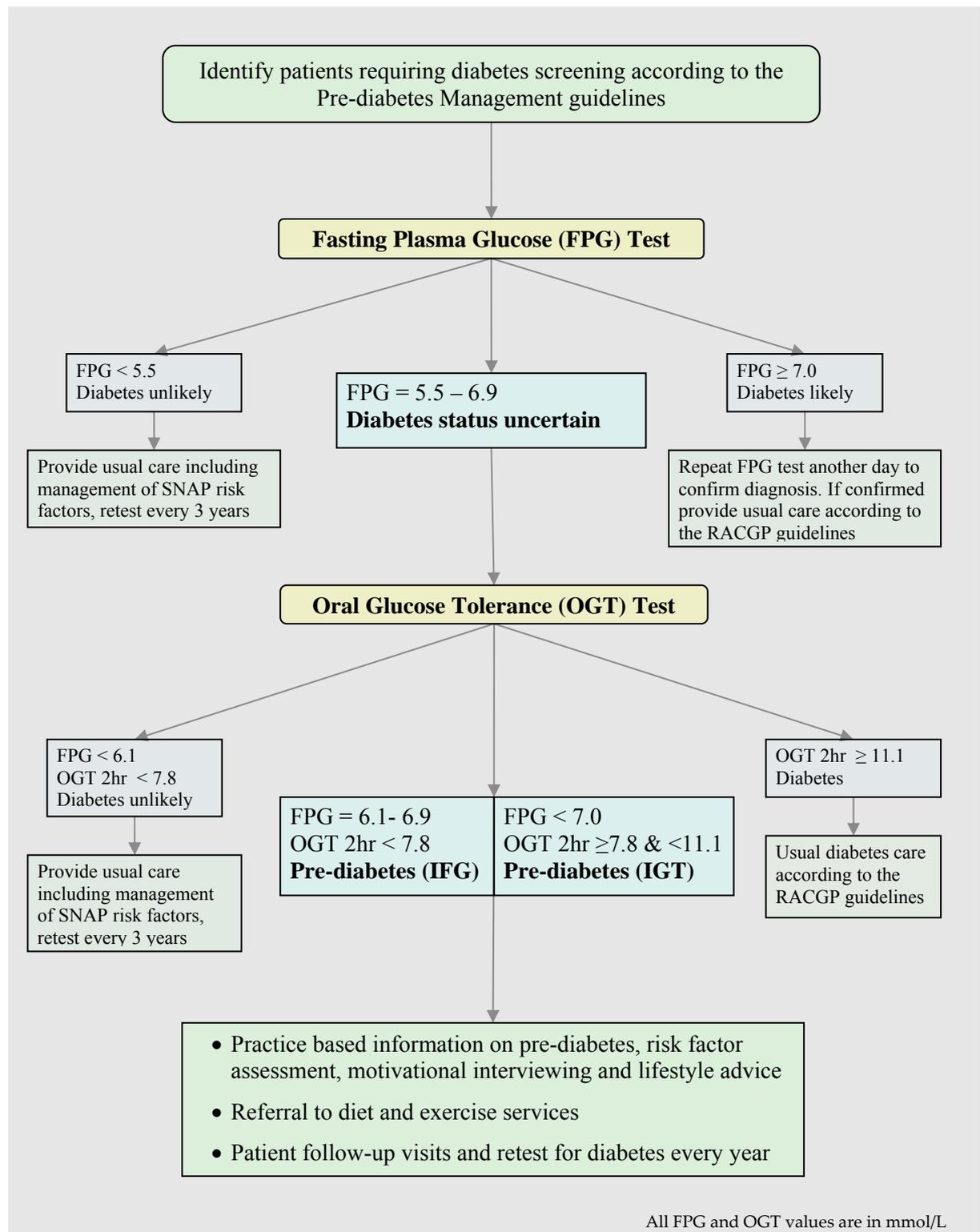
**G** Post-intervention referral service interview

**H** Post-intervention patient survey

**I** Intervention case study: Solo practice

**J** Intervention case study: Group Practice

# Screening and Management of Pre-diabetes in General Practice



# Population health profile of the St George District Division of General Practice

Population Profile Series: No. 8

PHIDU

November 2005



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The data in this report are designed to be used for needs assessment and planning purposes: while they are based on the best available data and analytic processes, data available by postcode or Statistical Local Area, as used in this report, cannot be precisely translated to Division. Division totals in the report should, therefore, be seen as estimates. Interpretation of differences between data in this profile and similar data from other sources needs to be undertaken with care, as such differences may be due to the use of different methodology to produce the data.

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# Population health profile

## of the *St George District Division of General Practice*

### Introduction

This profile has been designed to provide a description of the population of the St George District Division of General Practice, and aspects of their health. Its purpose is to provide information to support a population health approach, which aims to improve the health of the entire population and to reduce health inequalities among population groups: a more detailed discussion of a population health approach is provided in the supporting information, page 16.

### Contents

The profile includes a number of tables, maps and graphs to profile population health in the Division and provides comparisons with other areas (eg. Sydney and Australia). Specific topics covered include:

- a socio-demographic profile (pages 2-5);
- GP workforce data (page 5);
- immunisation rates (page 6);
- rates of premature death (page 7); and
- estimates of the prevalence of chronic disease and selected risk factors (pages 8-12).

### Key indicators

**Location:** New South Wales

**Division number:** 209

Population‡:	No.	%
Total	228,190	
65+	34,808	15.3%
<25	70,126	30.7%
Indigenous	1,139	0.5%

**Disadvantage score<sup>1</sup>:** 1006

**GP services per head of population:**

Division‡	6.1
Australia	4.7

**Population per FTEGP:**

Division‡	1,251
Australia	1,403

**Premature death rate<sup>2</sup>:**

Division‡	244.6
Australia	290.4

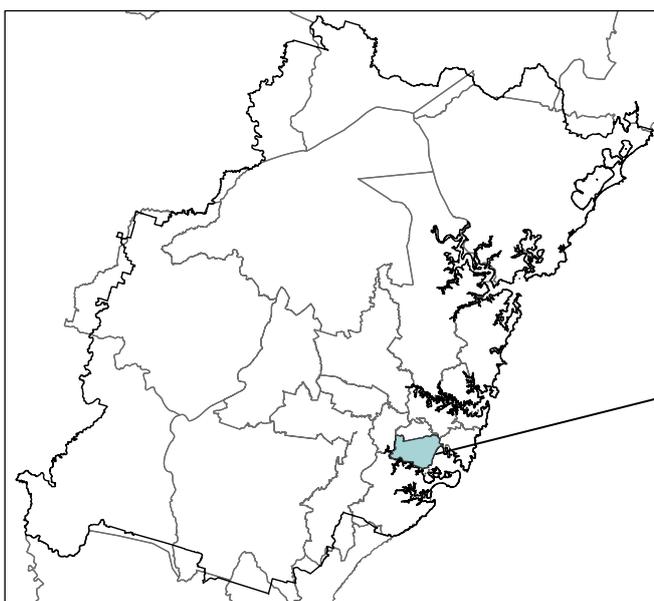
<sup>1</sup> Numbers above 1000 (the index score for Australia) indicate the Division is relatively advantaged

<sup>2</sup> Deaths at ages 0 to 74 years per 100,000 population

‡ See note "Data converters and mapping" re calculation of Division Total

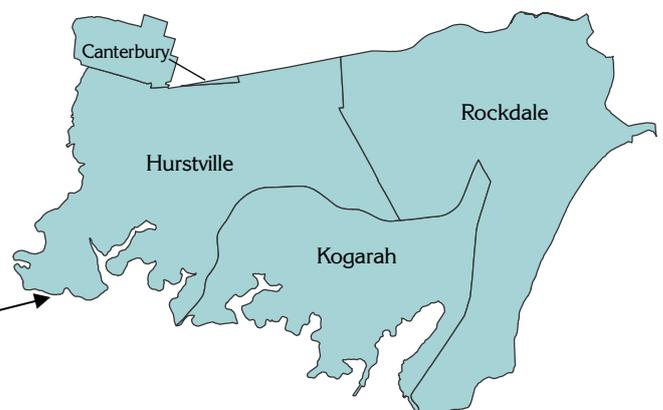
## St George District Division of General Practice

### Sydney Divisions of General Practice



— Sydney Divisions of General Practice  
 — Sydney Statistical Division

### St George District DGP by SLA

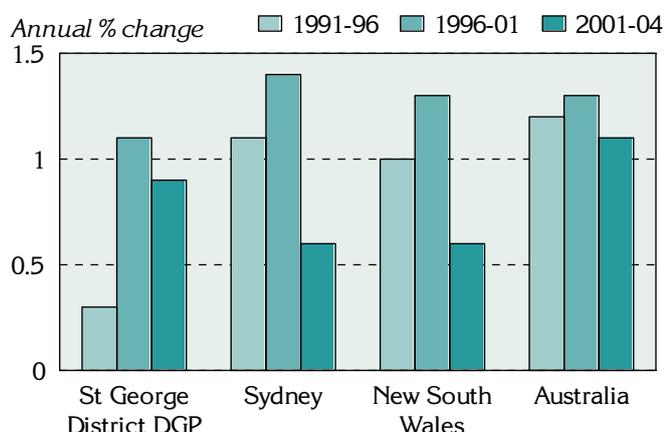


# Socio-demographic profile

## Population

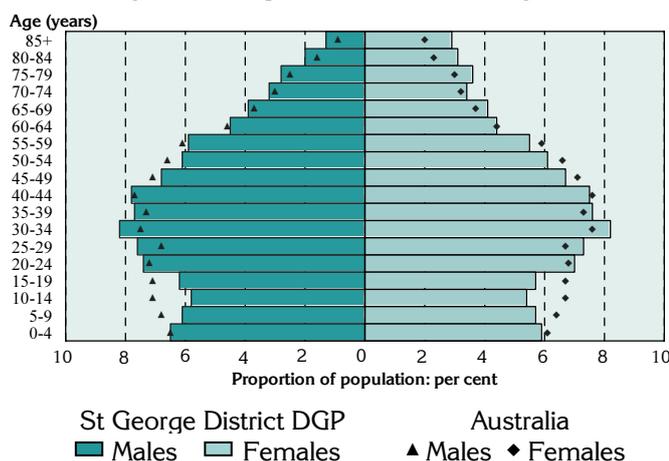
St George District Division had an Estimated Resident Population of 228,190 at 30 June 2004.

**Figure 1: Annual population change, St George District DGP‡, Sydney, New South Wales and Australia, 1991 to 1996, 1996 to 2001 and 2001 to 2004**



Over the five years from 1991 to 1996, the Division's population increase (0.3%) was lower than in Sydney (1.1%), New South Wales (1.0%) and Australia as a whole (1.2%). From 1996 to 2001 the annual increase rose to 1.1%, but was still lower than in Sydney (1.4%), New South Wales and Australia (both 1.3%). The growth rate from 2001 and 2004 (0.9%) was higher than the annual percentage increases for Sydney and New South Wales (0.6%), and lower than for Australia (1.1%).

**Figure 2: Population in St George District DGP‡ and Australia, by age and sex, 2004**



The age distribution of the Division's population is similar to that for Australia. The most notable differences are:

- at younger ages – lower proportions of children and young people aged 5 to 19 years;
- from 25 to 39 years – higher proportions of both males and females;
- from 45 to 59 years – slightly lower proportions of both males and females; and
- at older ages – marginally higher proportions of males and, particularly, females aged 65 years and over.

**Table 1: Population by age, St George District DGP‡ and Australia, 2004**

Age group (years)	St George District DGP		Australia	
	No.	%	No.	%
0-14	40,297	17.7	3,978,751	19.8
15-24	29,828	13.1	2,762,769	13.8
25-44	70,636	31.0	5,881,048	29.3
45-64	52,620	23.1	4,864,037	24.2
65-74	16,730	7.3	1,374,792	6.8
75-84	13,264	5.8	934,505	4.7
85+	4,814	2.1	295,602	1.5
<b>Total</b>	<b>228,190</b>	<b>100.0</b>	<b>20,091,504</b>	<b>100.0</b>

As shown in the age-sex pyramid above, St George District DGP had a lower proportion of children aged 0 to 14 years (17.7%) compared to Australia as a whole (19.8%) (Table 1), and a higher proportion of people aged 25 to 44 years (31.0%) compared to Australia (29.3%). The 65 years and over age groups also had slightly higher proportions than Australia.

Almost one quarter (24.0%) of the population of St George District DGP were born in predominantly non-English speaking countries and had been resident in Australia for five years or more (Table 2), compared to 17.8% in Sydney as a whole. Recent arrivals (those resident in Australia for less than five years) from non-English speaking countries were also predominant, comprising 5.8% of the Division's population (compared to 4.3% in Sydney).

‡ See note under 'Data converters and mapping' re calculation of Division totals on this page

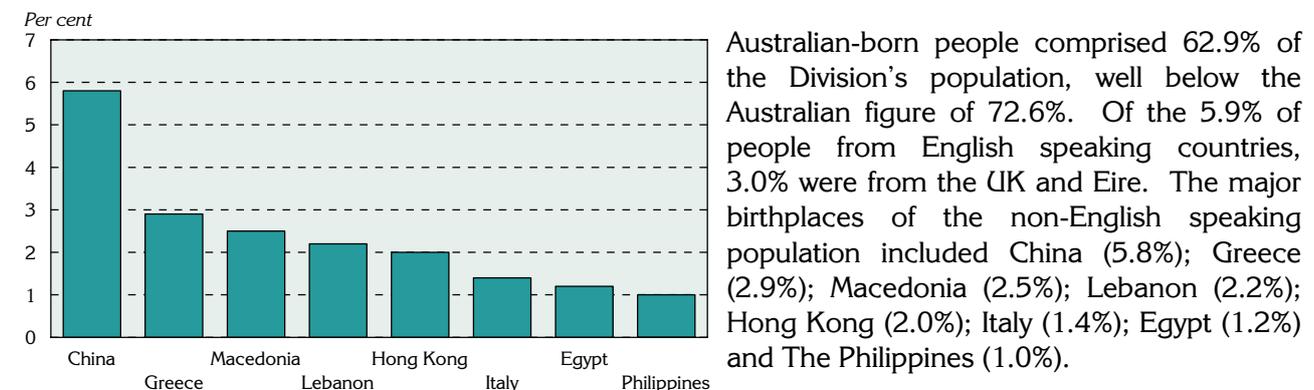
Of these residents, a notable 7.3% had poor proficiency in English (determined when people aged five years and over born overseas in predominantly non-English speaking countries reported in the Census speaking another language and speaking English 'not well' or 'not at all'), compared with Sydney (4.8%), New South Wales (3.2%) and Australia (2.4%).

**Table 2: Non-English speaking born, St George District DGP, Sydney, New South Wales and Australia, 2001**

People born in predominantly non-English speaking countries	St George District DGP		Sydney		New South Wales		Australia	
	No.	%	No.	%	No.	%	No.	%
Resident in Australia for five years or more	50,677	24.0	705,841	17.8	803,824	12.7	2,019,410	10.8
Resident in Australia for less than five years	12,246	5.8	170,580	4.3	182,972	2.9	408,074	2.2
Poor proficiency in English <sup>1</sup>	14,434	7.3	176,287	4.8	189,874	3.2	425,399	2.4

<sup>1</sup> Calculated on persons aged 5 years and over who reported speaking another language and speaking English 'not well' or 'not at all'.

**Figure 3: Major non-English speaking birthplaces, St George District DGP, 2001**



## Socioeconomic status

*The indicators presented in this section describe geographic variations in the distribution of the population for a number of key socioeconomic influences, which impact on the health and wellbeing of populations.*

The St George District DGP had lower proportions of single parent families (8.6%), and Aboriginal and Torres Strait Islanders (0.5%), compared to Sydney as a whole (with 9.6% and 1.1%, respectively) (Figure 4, Table 3).

Full time secondary school education participation of 16 year olds living in the Division (78.6%) was slightly higher than that for Sydney (76.2%).

There was little difference between the proportion of the Division's households who received rent assistance from Centrelink (13.0%) compared to Sydney (13.7%), and there were fewer dwellings rented from the State housing authority (4.1%, compared to 5.1%). The proportion of dwellings with no access to a motor vehicle (14.8%) was slightly higher than that for Sydney (13.1%).

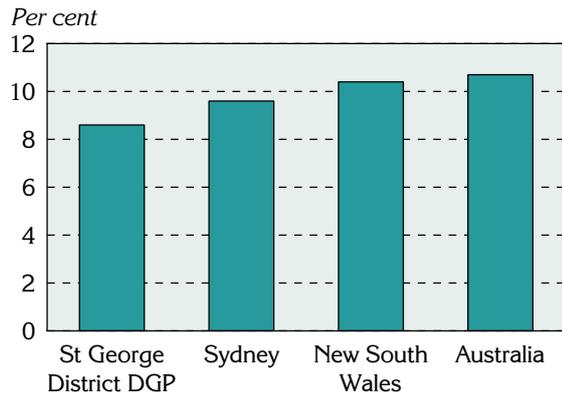
The Division had notably lower proportions of the population who reported using, at home, a computer (39.8%), and the Internet (28.4%) compared to Sydney (43.7% and 31.0%).

Overall, these mixed results show the Division to comprise a population of average socioeconomic status: see also the note on page 5 (Summary of socioeconomic ranking).

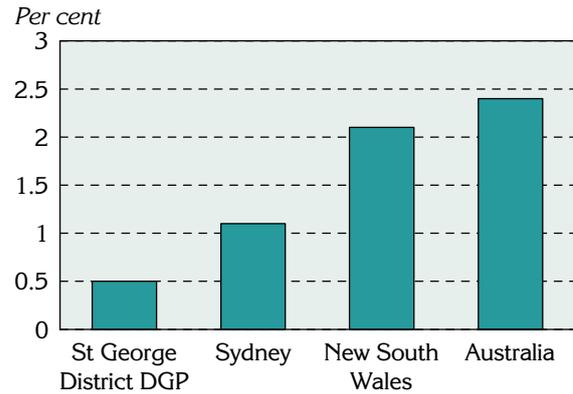
**Figure 4: Socio-demographic indicators, St George District DGP, Sydney, New South Wales and Australia, 2001**

*Note the different scales*

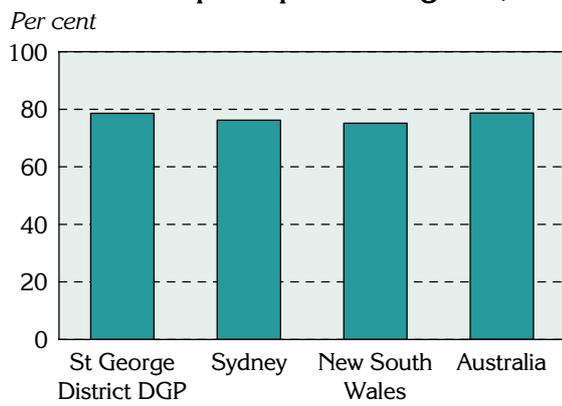
**Single parent families**



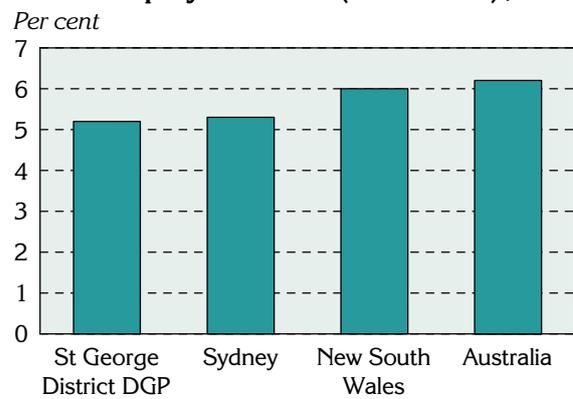
**Indigenous‡**



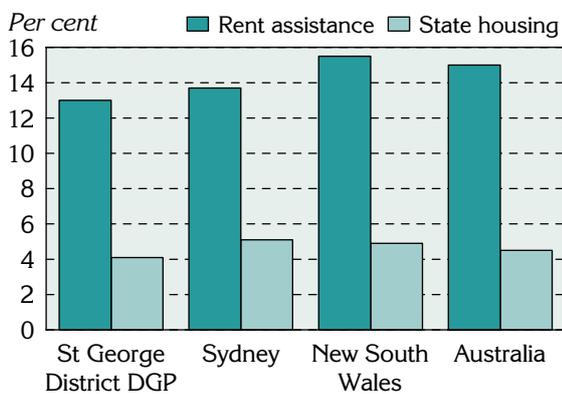
**Education participation at age 16‡**



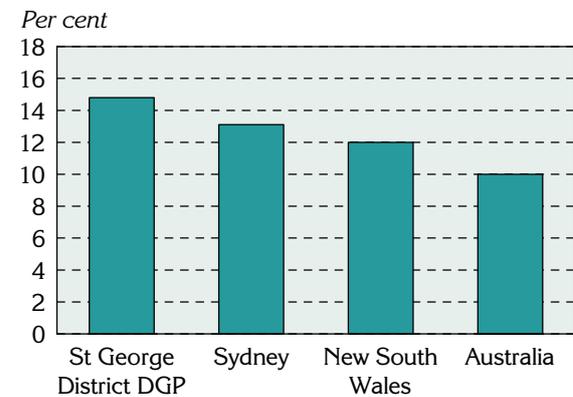
**Unemployment rate (June 2003)‡**



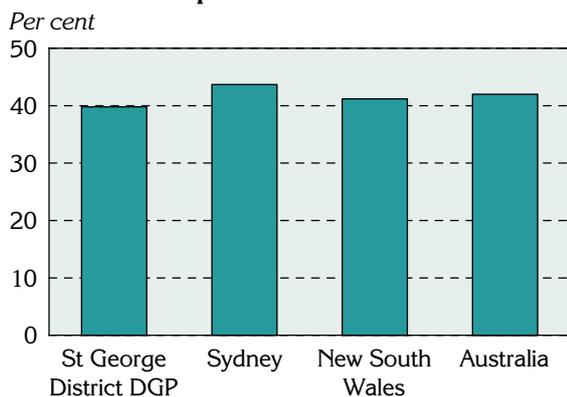
**Households receiving rent assistance & Dwellings rented from State housing authority**



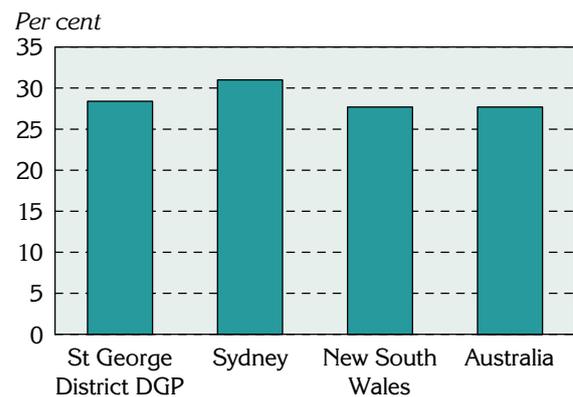
**Dwellings with no motor vehicle**



**Computer use at home**



**Internet use at home**



‡ See note under 'Data converters and mapping' re calculation of Division totals

**Table 3: Socio-demographic indicators, St George District DGP, Sydney, New South Wales and Australia, 2001**

Indicator	St George District DGP		Sydney		New South Wales		Australia	
	No.	%	No.	%	No.	%	No.	%
Single parent families	4,817	8.6	98,394	9.6	172,199	10.4	529,969	10.7
Indigenous‡	1,139	0.5	43,850	1.1	134,886	2.1	458,261	2.4
Full-time secondary education at age 16‡	2,031	78.6	40,951	76.2	65,205	75.2	130,198	78.7
Households: rent assistance	9,745	13.0	187,466	13.7	343,540	15.5	1,006,599	15.0
Dwellings rented from the State housing authority	3,246	4.1	72,724	5.1	114,130	4.9	317,171	4.5
Dwellings: no motor vehicle	11,655	14.8	187,858	13.1	280,434	12.0	708,073	10.0
Computer use at home	83,815	39.8	1,726,050	43.7	2,600,257	41.2	7,881,983	42.0
Internet use at home	60,047	28.4	1,227,632	31.0	1,751,626	27.7	2,019,410	27.7

‡ See note under 'Data converters and mapping' re calculation of Division total

The unemployment rate of 5.2% in St George District DGP was similar to Sydney (5.3%) and lower than New South Wales (6.0%) (Figure 4, Table 4). The labour force participation rate (73.6%) was slightly lower than Sydney (75.9%) and New South Wales (74.6%), while there was little difference in the female labour force participation rate (69.9%) compared to Sydney (70.2%) and New South Wales (69.0%).

**Table 4: Unemployment and labour force participation, St George District DGP, Sydney, New South Wales and Australia, 2003**

Labour force indicators	St George District DGP		Sydney		New South Wales		Australia	
	No.	%	No.	%	No.	%	No.	%
Unemployment rate‡	5,826	5.2	115,715	5.3	198,946	6.0	623,791	6.2
Labour force participation‡	111,538	73.6	2,188,568	75.9	3,331,064	74.6	10,038,147	75.2
Female labour force participation (2001)	37,653	69.9	731,898	70.2	1,093,243	69.0	3,306,521	69.7

‡ See note under 'Data converters and mapping' re calculation of Division total

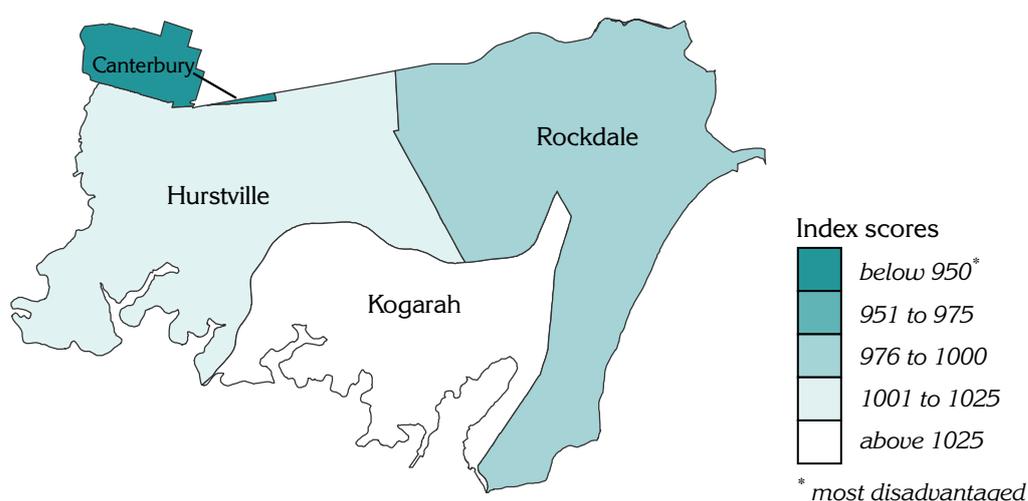
### Summary of the socioeconomic ranking of St George District DGP

Following the 2001 Census, the Australian Bureau of Statistics (ABS) produced four socioeconomic indexes for areas (SEIFA) which describe various aspects of the socioeconomic profile of populations in areas. Scores for these indexes for each Statistical Local Area (SLA) or part SLA in St George District DGP are shown in the supporting information in Table 9, page 16: SLAs are described on page 17.

St George District DGP area's SEIFA Index of Relative Socio-Economic Disadvantage (IRSD) score from the 2001 Census was 1006, marginally above the average score for Australia (1000) but below that for Sydney (1017); this highlights the near-average socioeconomic status profile of the Division's population. However, there are notable variations in the IRSD at SLA level (Map 1).

**Map 1: Index of Relative Socio-Economic Disadvantage by SLA, St George District DGP, 2001**

See note under 'Methods' re Data converters and mapping concerning SLAs mapped to the Division. This is of particular relevance where part of an SLA is mapped to the Division.



## General medical practitioner (GP) supply

A total of 181.6 full-time equivalent (FTE) GPs and 233.2 full-time workload equivalent (FWE<sup>1</sup>) GPs worked in the Division over 2003/04 (Table 5). Of the FWE GPs, 25.8% were female, and 43.4% were over 55 years of age (compared to 26.4% and 33.4%, respectively, for New South Wales).

Apart from the estimated day-time population, the rates of population per FTE GP varied, depending on the population measure used, from a high of 1,251 per GP (calculated on the average Estimated Resident Population (ERP) as at 30 June 2003 and 30 June 2004), to a low of 1,182 people per GP (calculated on the 1 August 2001 Census count – all people counted in the Division on Census night, including visitors from Australia and overseas). The rates of population per FWE GP were lower, ranging from 920 (calculated on the Census count) to 974 (calculated on the ERP).

When calculated on the estimated day-time population, the rates were 18.0% below those calculated on the Usual Resident Population (usual residents of the Division counted in Australia on Census night), reflecting the net movement of people out of the Division during the day for employment.

Based on the ERP, the rates of population per GP in St George District DGP were lower than the rates for New South Wales and Australia, indicating higher levels of provision of GP services in the Division.

**Table 5: Population per GP in St George District DGP, New South Wales and Australia, 2003/04**

Population measure	Population	GPs		Population per GP	
		FTE	FWE	FTE	FWE
<b>St George District DGP</b>					
Census count (adjusted)*	214,654	181.6	233.2	1,182	920
Usual Resident Population (URP) (adjusted)*	215,334	..	..	1,186	923
Estimated Resident Population (ERP)	227,162	..	..	1,251	974
Day-time population (estimated on URP)* ‡	176,515	..	..	972	757
<b>New South Wales (ERP)</b>	<b>6,706,674</b>	<b>4,819</b>	<b>5,969</b>	<b>1,392</b>	<b>1,124</b>
<b>Australia (ERP)</b>	<b>19,989,303</b>	<b>14,246</b>	<b>16,872</b>	<b>1,403</b>	<b>1,185</b>

\* The Census count, Usual Resident Population and Day-time population were adjusted to reflect population change between 2001 and 2003/2004, as measured by the ERP

‡ See note under 'Data converters and mapping' re calculation of Division totals

## Immunisation

Data from the Australian Childhood Immunisation Register show that 95.3% of children in the Division in 2002 were fully immunised at age one, marginally above the Australian proportion of 94.2%.

Immunisation by provider type for children between the ages of 0 to 6 is shown in Table 6. Children in the Division who were immunised were almost exclusively immunised by a general practitioner (99.7%) compared to 70.0% for Australia.

**Table 6: Childhood immunisation at ages 0 to 6 by provider type, St George District DGP and Australia, 2003/04**

Provider	St George District DGP	Australia
	%	%
General practitioner	99.7	70.0
Local government council	0.1	16.6
Community health centre/ worker	0.0	9.8
Public hospital	0.2	2.1
Aboriginal health service/ worker	0.0	0.9
Other*	0.0	0.6
<b>Total: Per cent</b>	<b>100.0</b>	<b>100.0</b>
<b>Number</b>	<b>41,616</b>	<b>3,843,610</b>

\* Includes immunisations in/ by State Health Departments, RFDS and private hospitals

<sup>1</sup>The FWE value is calculated for each GP location by dividing the GP's total Medicare billing (Schedule fee value of services provided during the reference period) by the mean billing of full-time doctors in that derived major speciality for the reference period. Thus, a GP earning 20% more than the mean billing of full-time doctors is shown as 1.2 FWE: this differs from full-time equivalent (FTE) counts, where the FTE value of any GP cannot exceed 1.0.

## Premature mortality

Deaths at ages below 75 years are used as an indicator of health status, as they largely reflect premature deaths, given the current levels of life expectancy in Australia.

The 'all causes' death rate in the Division at ages 0 to 74 years (244.6 deaths per 100,000 population) was notably lower than for Sydney (273.4) and Australia (290.4): the rates have been age standardised to allow for comparisons between areas, regardless of differences in age profiles between the Division and Australia.

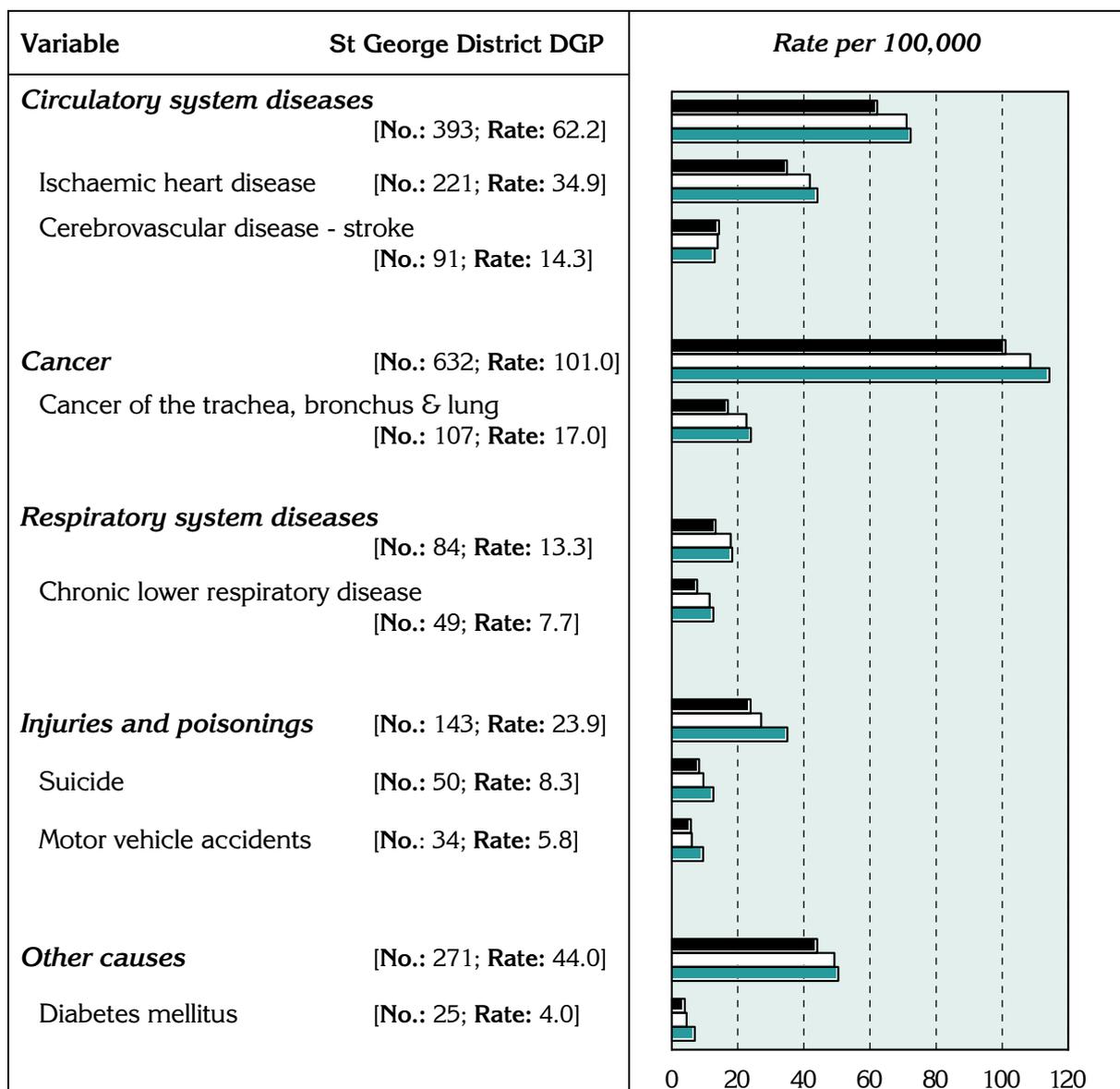
The major causes of premature mortality in the Division, as for Sydney and Australia as a whole, were cancer and diseases of the circulatory system, followed by the other causes group (Figure 5). With the exception of cerebrovascular disease – stroke, death rates in the Division for all of the causes shown were lower than those for Sydney and Australia as a whole.

The data on which the following chart is based are in Table 12.

**Figure 5: Deaths before 75 years of age by major condition group and selected cause, St George District DGP‡, Sydney and Australia, 2000-02\***

*Indirectly age standardised rate per 100,000 population*

■ St George District DGP    □ Sydney    ■ Australia



\* 'No.' is the total number of deaths for the 2000-02 period; 'Rate' is an annual rate, based on the 3-year average

‡ See note under 'Data converters and mapping' re calculation of Division totals

## Chronic diseases and risk factors

*The term “chronic disease” describes health problems that persist across time and require some degree of health care management (WHO 2002). Chronic diseases tend to have complex causes, are often long lasting and persistent in their effects, and can produce a range of complications (Thacker et al. 1995). They are responsible for a significant proportion of the burden of disease and illness in Australia and other westernised countries. Given the ageing of the population, this trend is likely to continue.*

*At different life stages, risk factors for chronic diseases and their determinants include genetic predisposition; poor diet and lack of exercise; alcohol misuse and tobacco smoking; poor intra-uterine conditions; stress, violence and traumatic experiences; and inadequate living environments that fail to promote healthy lifestyles (NPHP 2001). Risk factors are also more prevalent in areas of low socioeconomic status, and in communities characterised by low levels of educational attainment; high levels of unemployment; substantial levels of discrimination, interpersonal violence and exclusion; and poverty. There is a higher prevalence of risk factors among Indigenous communities, and other socioeconomically disadvantaged Australians (NPHP 2001).*

## Background

In this section, estimates of the prevalence of selected chronic diseases and risk factors, and two summary measures of health, are shown for the Division‡, and for SLAs within the Division: note that the estimates have been predicted from self-reported data, and are not based on clinical records or physical measures. The chronic diseases and risk factors are those for which sufficiently reliable estimates can be made for the Division from national survey data. The process by which the estimates have been made, and details of their limitations, are described in the Notes section, pages 14-15. The data on which the following charts are based are in Table 13.

The estimates provide information of relevance to a number of the National Health Priority Areas (NHPAs – asthma; cardiovascular health; diabetes mellitus; injury prevention and control; mental health; and arthritis and musculoskeletal conditions: estimates have not been made for cancer control, the other NHPA). The risk factors for which estimates have been made are those which are accepted as being associated with these important chronic conditions. They are overweight (not obese), obesity, smoking, lack of exercise and high-risk alcohol use.

*The numbers are estimates for an area, not measured events as are death statistics: they should be used as indicators of likely levels (and not actual levels) of a condition or risk factor in an area.*

## Prevalence Estimates: chronic disease‡

It is estimated that, with the exception of diabetes type 2, relatively fewer people in St George District DGP reported having any of the selected chronic conditions (Figure 6) compared to Australia as a whole: that is, the prevalence rates per 1,000 population were lower.

## Prevalence estimates: self-reported health‡

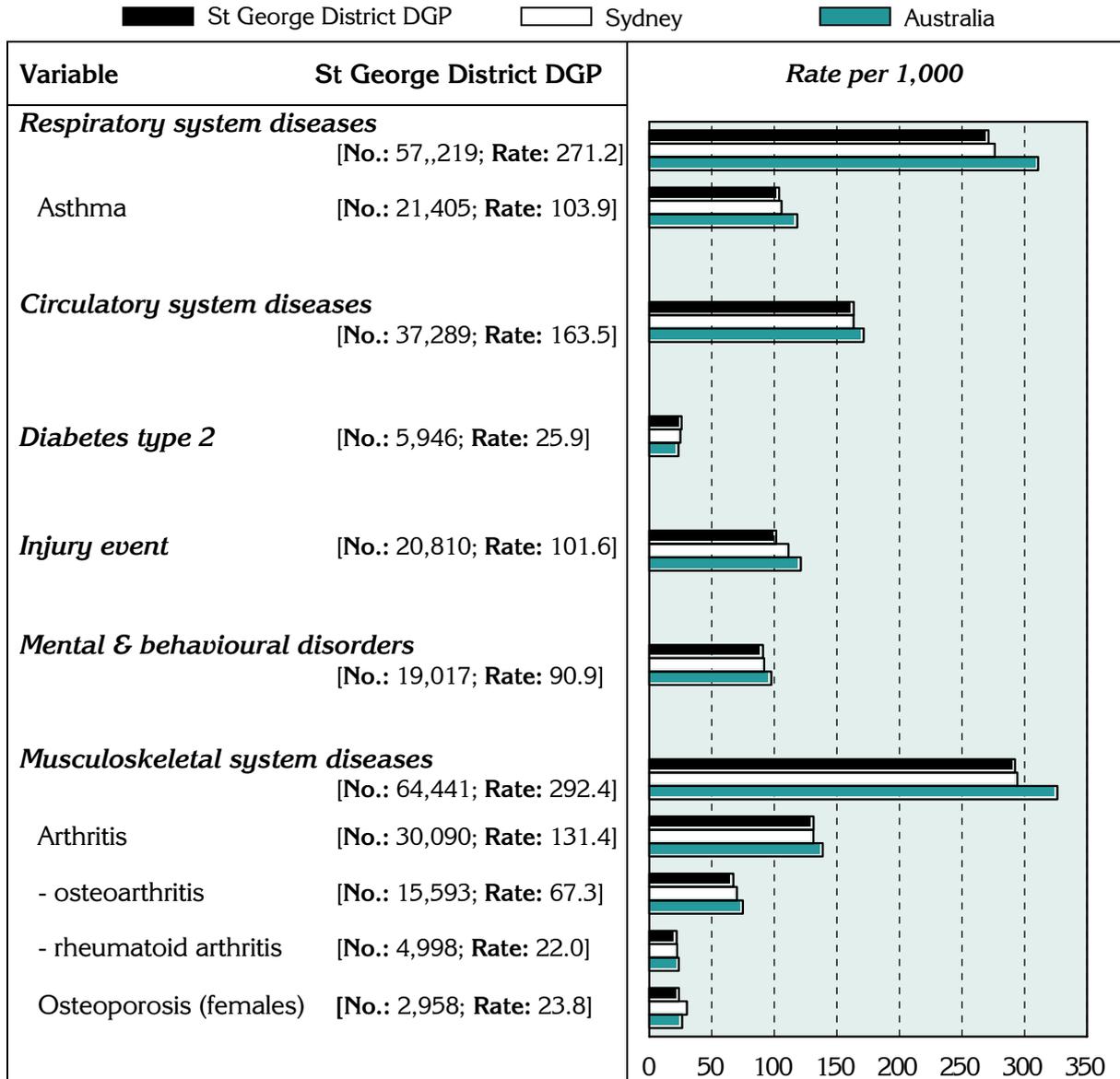
The NHS includes two measures of self-reported health. One is the Kessler Psychological Distress Scale–10 items (K–10). This is a scale of non-specific psychological distress based on 10 questions about negative emotional states in the four weeks prior to interview, asked of respondents 18 years and over (ABS 2002). The other asks respondents aged 15 years and over to rate their health on a scale from ‘excellent’, through ‘very good’, ‘good’ and ‘fair’, to ‘poor’ health.

The population of the Division aged 18 years and over is estimated to have a similar proportion of people with very high psychological distress levels as measured by the K–10 (Figure 7) than Australia as a whole. The proportion of the population aged 15 years and over estimated to have reported their health as ‘fair’ or ‘poor’ is slightly above the national average.

‡ See note under ‘Data converters and mapping’ re calculation of Division totals

**Figure 6: Estimates\* of chronic disease and injury, St George District DGP‡, Sydney and Australia, 2001**

*Indirectly age standardised rate per 1,000 population*

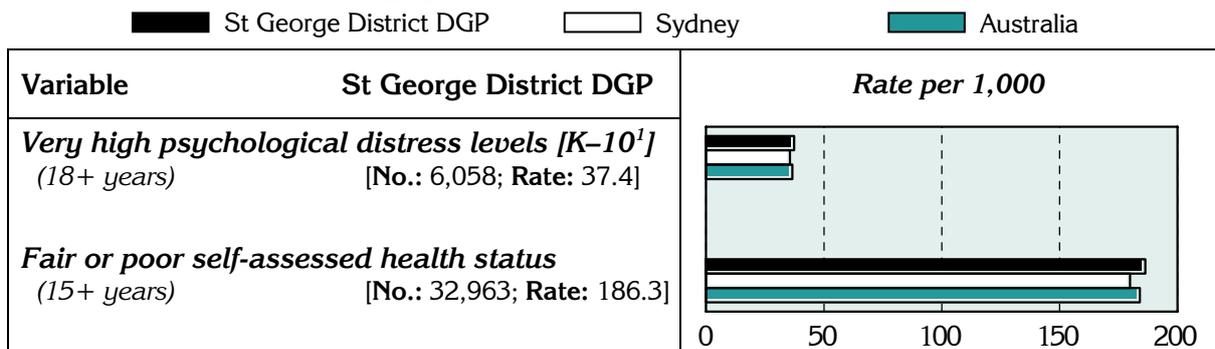


\* 'No.' is a weighted estimate of the number of people in St George District DGP reporting each chronic condition and is derived from synthetic predictions from the 2001 NHS

‡ See note under 'Data converters and mapping' re calculation of Division totals

**Figure 7: Estimates\* of measures of self-reported health, St George District DGP‡, Sydney and Australia, 2001**

*Indirectly age standardised rate per 1,000 population*



\* 'No.' is a weighted estimate of the number of people in St George District DGP reporting under these measures and is derived from synthetic predictions from the 2001 NHS

<sup>1</sup> Kessler 10

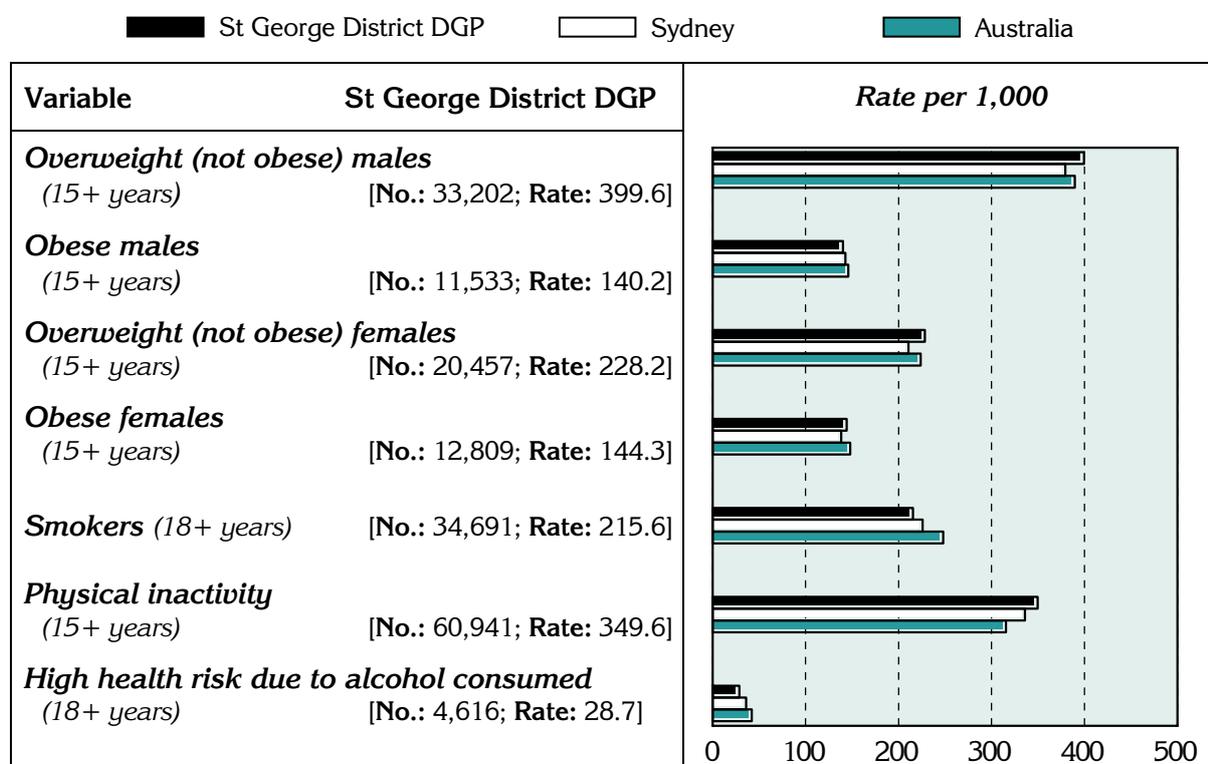
‡ See note under 'Data converters and mapping' re calculation of Division totals

## Prevalence estimates: risk factors‡

The Division is estimated to have relatively lower rates (when compared with the Australian population) for obesity in males and females, smoking and high-risk alcohol use (Figure 8). The reported rates for overweight males and females, and physical inactivity are higher than the national rates.

**Figure 8: Estimates\* of selected risk factors, St George District DGP‡, Sydney and Australia, 2001**

*Indirectly age standardised rate per 1,000 population*



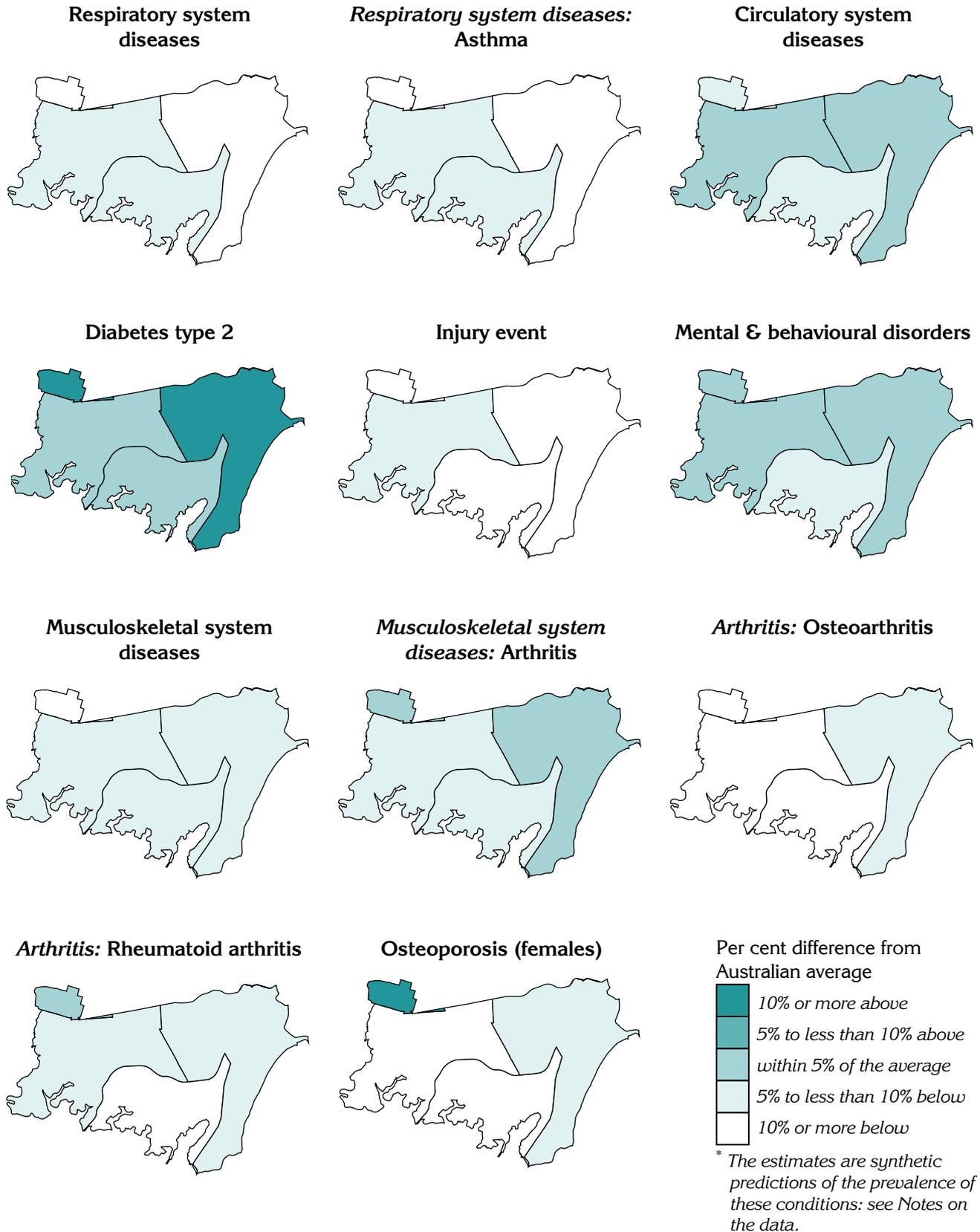
\* 'No.' is a weighted estimate of the number of people in St George District DGP with these risk factors and has been predicted using data from the 2001 NHS and known data for the Division

‡ See note under 'Data converters and mapping' re calculation of Division totals

The following maps provide details of the geographic distribution, at the SLA level, of the estimated prevalence of chronic disease (Map 2), self-reported health (Map 3) and risk factors associated with chronic disease (Map 4).

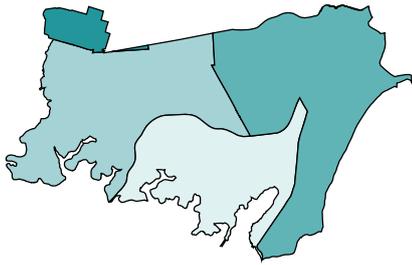
In the following maps, users should note that the estimates shown for part SLAs in the Division (see Table 11, page 17 for the per cent of SLA population in the Division) represent the estimates for the whole SLA, and not just the part shown. However, SLAs with only a small proportion of their population in the Division are likely to have little influence on the total estimates for the Division, which have been based on the percentage of the SLA population in the Division.

Map 2: Estimates\* of chronic disease and injury by SLA, St George District DGP, 2001



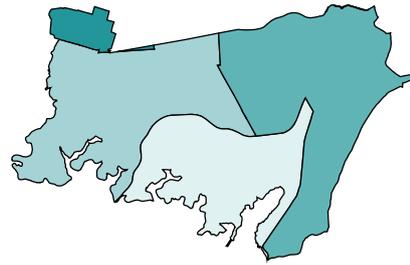
**Map 3: Estimates\* of measures of self-reported health by SLA, St George District DGP, 2001**

**Very high psychological distress levels [K-10<sup>1</sup>] (18+ years)**



<sup>1</sup> Kessler 10

**Fair or poor self-assessed health status (15+ years)**



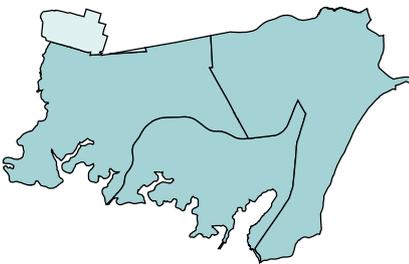
Per cent difference from Australian average



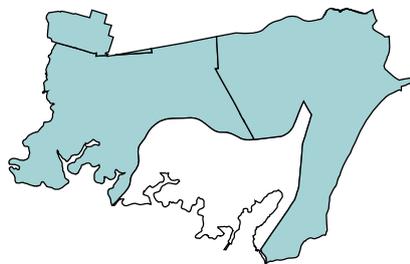
\* The estimates are synthetic predictions of the prevalence of the population reporting under these measures: see Notes on the data.

**Map 4: Estimates\* of selected risk factors by SLA, St George District DGP, 2001**

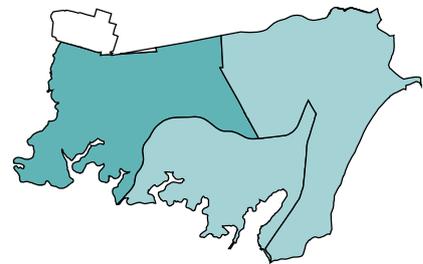
**Overweight (not obese) males (15+ years)**



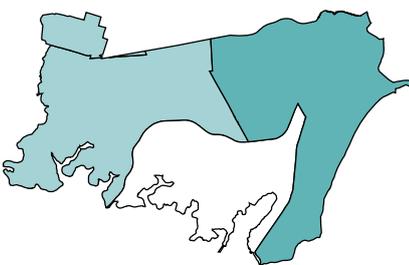
**Obese males (15+ years)**



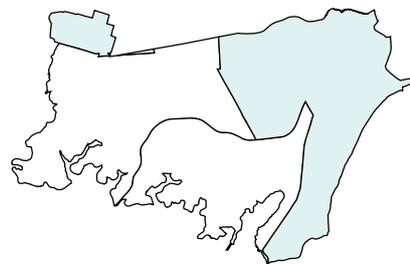
**Overweight (not obese) females (15+ years)**



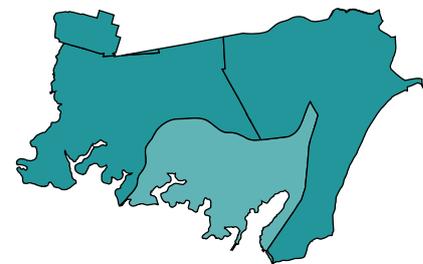
**Obese females (15+ years)**



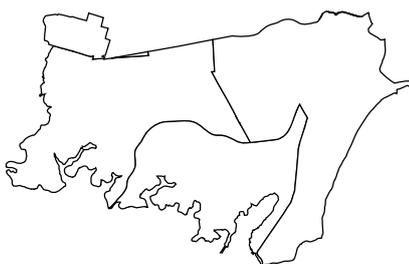
**Smokers (18+ years)**



**Physical inactivity (15+ years)**



**High health risk due to alcohol consumed (18+ years)**



Per cent difference from Australian average



\* The estimates are synthetic predictions of the prevalence of these risk factors: see Notes on the data.

# Notes on the data

## Data sources and limitations

### General

Unless stated otherwise, references to 'Sydney' relate to the Sydney Statistical Division.

### Data sources

Table 7 details the data sources for the material presented in this profile.

**Table 7: Data sources**

Section	Source
<b>Key indicators</b>	
GP services per head of population	GP services data supplied by Department of Health and Ageing, 2003/04 Population data: Estimated Resident Population, ABS, mean of 30 June 2003 and 30 June 2004 populations
<b>Socio-demographic profile</b>	
Figures 1 and 2; Table 1	Estimated Resident Population, ABS, 30 June for the periods shown
Tables 2, 3 and 4; Figures 3 and 4	Data were extracted by postal area from the ABS Population Census 2001 <sup>1</sup> , except for the following indicators: - <i>Indigenous</i> – Experimental estimates of Aboriginal and Torres Strait Islander people, ABS 2001 (unpublished) - <i>Full-time secondary education participation at age 16</i> – Census 2001 (unpublished) - <i>Households receiving rent assistance</i> – Centrelink, December Quarter 2001 (unpublished) - <i>Unemployment rate / Labour force participation</i> – extracted from <i>Small Area Labour Markets Australia</i> , June Quarter 2003, Department of Employment and Workplace Relations
Map 1; Table 9	ABS SEIFA package, Census 2001
<b>General medical practitioner (GP) supply</b>	
Table 5	GP data supplied by Department of Health and Ageing, 2003/04 Population estimates used in calculating the population per GP rates are the: - Census count <sup>2</sup> , ABS Population Census 2001, scaled to 2003/04 - Usual Resident Population <sup>3</sup> , ABS Population Census 2001, scaled to 2003/04 - Day-time population: calculated from journey to work data, ABS Population Census (JRP) 2001 (unpublished); and 2001 Census JRP, scaled to 2003/04 - Estimated Resident Population, ABS, June 2003/2004
<b>Immunisation</b>	
Text comment: 1 year olds	National Centre for Immunisation Research and Surveillance, 2002
Table 6	Australian Childhood Immunisation Register, Health Insurance Commission, 2003/04 (unpublished)
<b>Premature mortality</b>	
Figure 5; Table 12	ABS Deaths, 2000 to 2002
<b>Chronic diseases and associated risk factors<sup>4</sup></b>	
Figures 6, 7 and 8; Maps 2, 3 and 4; Table 13	Estimated from 2001 National Health Survey (NHS), ABS (unpublished)

<sup>1</sup> All data extracted from Usual Residents Profile, except for data variables only released in the Basic Community Profile

<sup>2</sup> *Census count* - those counted in the Division on Census night, including tourists, business people and other visitors

<sup>3</sup> *Usual Resident Population* - those who usually live there and who were in Australia at the time and would have provided details in the Census at the address where they were counted

<sup>4</sup> See notes below

## Chronic diseases and associated risk factors

The data for chronic conditions and risk factors for SLAs have been estimated from the 2001 National Health Survey (NHS), conducted by the ABS: see note below on synthetic estimates. The NHS sample includes the majority of people living in private households, but excludes the most remote areas of Australia. These areas cover 86.4% of Australia's land mass and comprise just 3% of the total population, however, 28% of Australia's Indigenous population live in these areas. Thus it has not been possible to produce these estimates for Divisions with relatively high proportions of their population in the most remote areas of Australia.

The data for chronic conditions and risk factors are self-reported data, reported to interviewers in the 2001 NHS. Table 8 includes notes relevant to this data.

**Table 8: Notes on estimates of chronic diseases and associated risk factors**

Indicator	Notes on the data
<b>Estimates of chronic disease and injury</b> (Figure 6 and Map 2)	
Long term conditions	- Respondents were asked whether they had been diagnosed with any long term health condition (a condition which has lasted or is expected to last for 6 months or more), and were also asked whether they had been told by a doctor or nurse that they had asthma, cancer, heart and circulatory conditions, and/or diabetes
Injury event	- Injuries which occurred in the four weeks prior to interview
<b>Estimates of measures of self-reported health</b> (Figure 7 and Map 3)	
Very high psychological distress levels (K10)	- Derived from the Kessler Psychological Distress Scale-10 items (K-10), which is a scale of non-specific psychological distress based on 10 questions about negative emotional states in the 4 weeks prior to interview. 'Very high' distress is the highest level of distress category (of a total of four categories)
Fair or poor self-assessed health status	- Respondent's general assessment of their own health, against a five point scale from excellent through to poor – 'fair' or 'poor' being the two lowest in the scale
<b>Estimates of selected risk factors</b> (Figure 8 and Map 4)	
Overweight (not obese)	- Based on self-reported height and weight; BMI calculated and grouped into categories (to allow reporting against both WHO and NHMRC guidelines) - overweight: 25.0 to less than 30.0
Obese	- Based on self-reported height and weight; BMI calculated and grouped into categories (to allow reporting against both WHO and NHMRC guidelines) – obese: 30.0 and greater
Smokers	- Respondent's undertaking regular (or daily) smoking at the time of interview
Physical inactivity	- Did not exercise in the two weeks prior to interview through sport, recreation or fitness (including walking) – excludes incidental exercise undertaken for other reasons, such as for work or while engaged in domestic duties
High health risk due to alcohol consumed	- Respondents estimated average daily alcohol consumption in the seven days prior to interview (based on number of days and quantity consumed). Alcohol risk levels were grouped according to NHMRC risk levels for harm in the long term, with 'high risk' defined as a daily consumption of more than 75 ml for males and 50 ml for females

**Note:** For a full description, refer to *ABS 2001 National Health Survey, Cat. No. 4364.0* and *ABS 2001 Health Risk Factors, Cat. No. 4812.0*

## Methods

### Synthetic estimates

The estimates of the prevalence of chronic disease and associated risk factors have been predicted for a majority of SLAs across Australia, using modelled survey data collected in the 2001 ABS National Health Survey (NHS) and known characteristics of the area. A synthetic prediction can be interpreted as the likely value for a 'typical' area with those characteristics: the SLA is the area level of interest for this project (where SLAs had small populations they were grouped to larger areas). This work was undertaken by the Australian Bureau of Statistics, as they hold the NHS unit record files: the small area data were compiled by PHIDU.

The approach used is to undertake an analysis of the survey data for Australia to identify associations in the NHS data between the variables that we wish to predict at the area level (eg. prevalence of chronic conditions and risk factors) and the data we have at the area level (eg. socioeconomic status, use of health services). The relationship between these variables for which we have area level data (the predictors) and the reporting of chronic conditions in the NHS is also a part of the model that is developed by the ABS. For example, such associations might be between the number of people reporting specified chronic conditions in the NHS and:

- the number of hospital admissions (in total, to public and to private hospitals, by age, sex and diagnosis),
- socioeconomic status (as indicated by Census data, or for recipients of government pensions and benefits), and
- the number of visits to a general medical practitioner.

The results of the modelling exercise are then applied to the SLA counts of the predictors. The prediction is, effectively, the likely value for a typical area with those characteristics. The raw numbers were then age-standardised, to control for the effects of differences in the age profiles of areas.

*The numbers are estimates for an area, not measured events as are death statistics: they should be used as indicators of likely levels of a condition or risk factor in an area.*

### Premature deaths

Details of deaths by SLA were purchased from the ABS. The raw numbers were then age-standardised, by the indirect method, to control for the effects of differences in the age profiles of areas.

### Data converters and mapping

#### [Conversion to Division of data available by postcode](#)

The allocation of postcodes to Divisions was undertaken using information from the Department of Health and Ageing's web site, which shows the proportion of a postcode in a Division (Table 10).

#### [Conversion to Division of data available by SLA](#)

(marked in this profile as ‡ See note under 'Data converters and mapping' re calculation of Division total)

Where the data presented in these profiles were only available by SLA they have been converted to Division of General Practice areas using a concordance based on data at the 2001 Census. A copy of the concordance is included in the Population data: A Guide for Divisions of General Practice: it is also available from the Divisions' data area on PHIDU web site.

In brief, the concordance splits the data (eg number of deaths) for each SLA across one or more Divisions. The proportion of an SLA's data that is allocated to each Division was calculated from (a) CD level Census 2001 data that splits SLAs across approximations to postcodes (referred to as postal areas) and (b) data on the DoHA website that splits postcodes across Divisions. This concordance can be adjusted to meet any new configuration of Division boundaries based on the 2001 Collection Districts, or combinations thereof.

The estimated population of each SLA in this Division is shown in Table 11.

#### [Mapping](#)

In some Divisions the maps may include a very small part of an SLA which has not been allocated any population, or has a population of less than 100: these areas are mapped with a pattern.

## Supporting information

This and other information is also available at [www.publichealth.gov.au](http://www.publichealth.gov.au)

### A definition of population health

Population health, in the context of general practice, has been defined<sup>1</sup> as:

*“The prevention of illness, injury and disability, reduction in the burden of illness and rehabilitation of those with a chronic disease. This recognises the social, cultural and political determinants of health. This is achieved through the organised and systematic responses to improve, protect and restore the health of populations and individuals. This includes both opportunistic and planned interventions in the general practice setting.”*

The key determinants of health are social support networks, employment and working conditions, social environments, physical environments, geographical isolation, personal health practices, healthy child development, ageing and disability, biology and genetic endowment, health services, gender and culture.

In the Aboriginal and Torres Strait Islander context this means that a population health approach to health services will assist in ensuring “that Aboriginal and Torres Strait Islander people enjoy a healthy life equal to that of the general population, that is enshrined by a strong living culture, dignity and justice”.<sup>2</sup> This recognises the importance of achieving improvements to Aboriginal and Torres Strait Islander health and respects the particular health issues facing Indigenous people.

<sup>1</sup> “The role of general practice in population health – A Joint Consensus Statement of the General Practice Partnership Advisory Council and the National Public Health Partnership Group” (Joint Advisory Group on General Practice and Population Health 2001)

<sup>2</sup> As defined in the Strategic Framework for Aboriginal and Torres Strait Islander Health

### SEIFA scores

Following the 2001 Census, the Australian Bureau of Statistics (ABS) produced four socioeconomic indexes for areas (SEIFA). The indexes describe various aspects of the socioeconomic make-up of populations in areas, using data collected in the 2001 Census.

The Index of Relative Socio-Economic Disadvantage (labelled ‘Disadvantage’ in Table 9) includes all variables that either reflect or measure disadvantage. The Index of Advantage/Disadvantage is used to rank areas in terms of both advantage and disadvantage: any information on advantaged persons in an area will offset information on disadvantaged persons in the area. The Index of Economic Resources and the Index of Education and Occupation were targeted towards specific aspects of advantage/disadvantage.

For further information on the composition and calculation of these indexes see the ABS Information Paper ABS Cat No. 2039.0 available on the ABS web site [www.abs.gov.au](http://www.abs.gov.au). The scores for these indexes for each Statistical Local Area (SLA) or part SLA in St George District DGP are shown in Table 9.

**In using this table, users should note that the index score shown for SLAs with less than 100 per cent in the Division represents the score for the whole SLA, and not just the part shown. However, SLAs with small proportions may have little influence on the average index score for the Division which has been based on the postcodes in the Division.**

Table 9: SEIFA scores by SLA, St George District DGP, 2001

SLA code	SLA name (£ per cent of SLA in the Division)	Index score			
		Disadvantage	Advantage	Economic Resources	Education & Occupation
11550	Canterbury (7.9)	923	965	986	971
14150	Hurstville (91.6)	1019	1043	1060	1041
14450	Kogarah (100.0)	1050	1080	1101	1073
16650	Rockdale (98.6)	987	1013	1045	1010

\* Proportions are approximate and are known to be incorrect in some cases, due to errors in the concordance used to allocate CDs to form postal areas

## Statistical geography of St George District DGP

The postcodes in the Division (as per the Department of Health and Ageing web site) are shown below (Table 10).

**Table 10: Postcodes in St George District DGP, 2004**

Postcode	Per cent of postcode population in the Division*	Postcode	Per cent of postcode population in the Division*	Postcode	Per cent of postcode population in the Division*
1481	100	2209	50	2219	100
1485	100	2210	100	2220	100
2205	100	2216	100	2221	100
2207	100	2217	100	2222	100
2208	50	2218	100	2223	100

\* Proportions are approximate

Source: Department of Health and Ageing web site (accessed online version as at February 2005):

<http://www.health.gov.au/internet/wcms/publishing.nsf/Content/health-pcd-programs-divisions-divspc.htm>

Statistical Local Areas (SLAs) are defined by the Australian Bureau of Statistics to produce areas for the presentation and analysis of data. In the St. George District Division all of Kogarah lies within the Division, as do parts of Rockdale, Hurstville and Canterbury (Table 11).

**Table 11: SLAs in St George District DGP by 2001 boundaries**

SLA code	SLA name	Per cent of the SLA's population in the Division*	Estimate of the SLA's 2004 population in the Division
11550	Canterbury	7.9	10,586
14150	Hurstville	91.6	69,155
14450	Kogarah	100.0	54,906
16650	Rockdale	98.6	93,544

\* Proportions are approximate and are known to be incorrect in some cases, due to errors in the concordance used to allocate CDs to form postal areas

## Supporting data

The data used in Figure 5 to illustrate the rates of premature mortality in the Division are shown below in Table 12.

**Table 12: Deaths before 75 years of age by major condition group and selected cause, St George District DGP‡, Sydney and Australia, 2000-02\***

*Indirectly age standardised rate per 100,000 population*

Variable	St George District DGP‡		Sydney		Australia	
	No.	Rate	No.	Rate	No.	Rate
<b>Circulatory system diseases</b>	393	62.2	7,428	71.1	38,357	72.3
Ischaemic heart disease	221	34.9	4,359	41.8	23,364	44.1
Cerebrovascular disease – stroke	91	14.3	1,451	13.9	6,920	13.0
<b>Cancer</b>	632	101.0	11,366	108.5	60,603	114.3
Cancer of the trachea, bronchus & lung	107	17.0	2,347	22.6	12,715	24.0
<b>Respiratory system diseases</b>	84	13.3	1,866	17.9	9,726	18.3
Chronic lower respiratory disease	49	7.7	1,191	11.5	6,657	12.6
<b>Injuries and poisonings</b>	143	23.9	3,077	27.1	18,573	35
Suicide	50	8.3	1,101	9.6	6,706	12.6
Motor vehicle accidents	34	5.8	692	6.1	5,014	9.5
<b>Other causes</b>	271	44.0	5,283	49.2	26,735	50.4
Diabetes mellitus	25	4.0	541	4.5	3,734	7.0

\* 'No.' is the total number of deaths for the 2000-02 period; 'Rate' is an annual rate, based on the 3 year average

‡ See note under 'Data converters and mapping' re calculation of Division totals

The rates used to illustrate the prevalence estimates of chronic disease and injury (Figure 6), measures of self-reported health (Figure 7), and selected risk factors (Figure 8), are shown in Table 13 below.

**Table 13: Estimates of chronic disease and associated risk factors, St George District DGP‡, Sydney and Australia, 2001**

*Indirectly age standardised rate per 1,000 population*

Variable	St George District DGP‡	Sydney	Australia
<b>Chronic disease and injury (Figure 6)</b>			
Respiratory system diseases	271.2	276.2	310.8
Asthma	103.9	105.8	118.3
Circulatory system diseases	163.5	163.4	171.5
Diabetes type 2	25.9	25.0	23.4
Injury event	101.6	111.4	121.2
Mental & behavioural disorders	90.9	91.9	97.6
Musculoskeletal system diseases	292.4	294.3	326.2
Arthritis	131.4	131.3	138.8
- Osteoarthritis	67.3	70.2	74.9
- Rheumatoid arthritis	22.0	22.3	23.6
Osteoporosis (females)	23.8	30.1	26.4
<b>Measures of self-reported health (Figure 7)</b>			
Very high psychological distress levels (18+ years)	37.4	35.6	36.6
Fair or poor self-assessed health status (15+ years)	186.3	179.9	184.0
<b>Risk factors (Figure 8)</b>			
Overweight (not obese) males (15+ years)	399.6	379.3	389.7
Obese males (15+ years)	140.2	142.9	145.9
Overweight (not obese) females (15+ years)	228.2	210.7	223.9
Obese females (15+ years)	144.3	138.4	148.0
Smokers (18+ years)	215.6	225.9	248.0
Physical inactivity (15+ years)	349.6	335.9	315.5
High health risk due to alcohol consumed (18+ years)	28.7	36.0	42.1

‡ See note under 'Data converters and mapping' re calculation of Division totals

## References

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## Further developments and updates

Subject to agreement and funding, a number of developments could be undertaken:

- Details of hospitalisations potentially avoidable through ambulatory care interventions are currently being prepared and will be forwarded to Divisions (and posted on the PHIDU web site) when they are available. Other enhancements will be considered as appropriate datasets become available.

The profiles could be updated as the data are updated. For example:

- Population estimates, avoidable hospitalisations, immunisation, and GP activity and workforce data – annually;
- Chronic disease estimates – three-yearly;
- Census data – five-yearly.

Any developments would be informed by consultation, including with Divisions.

## PHIDU contact details

**For general comments, data issues or enquiries re information on the web site, please contact PHIDU:**

Phone: 08-8303 6236 or e-mail: [PHIDU@publichealth.gov.au](mailto:PHIDU@publichealth.gov.au)

## **Appendix C: Pre-intervention interviews with GPs**

The University of New South Wales is conducting this study to determine current practices and needs for the screening and management of “pre-diabetes” in general practice with the support of allied health and community services. Interviews are being conducted with GPs, practice staff, division staff, AHS, and service providers.

Pre-diabetes is a condition in which a person's blood sugar (glucose) level is above normal but below a level that indicates diabetes. Pre-diabetes has no symptoms and can only be diagnosed with a blood glucose test.

Pre-diabetes may be called impaired glucose tolerance or impaired fasting glucose, depending on the test used to diagnose it. The screening procedure includes the fasting blood sugar test, which is followed by an oral glucose tolerance test if diabetes is suspected.

Some people with pre-diabetes go on to develop type 2 diabetes later in life, and recent studies indicate that pre-diabetes increases the risk of heart disease. People with pre-diabetes may be able to prevent type 2 diabetes by making changes in their diets and increasing their levels of physical activity.

Diabetes prevention depends on patients with “pre-diabetes” (IGT, IFG) being identified opportunistically or in routine diabetes screening in general practice and managed by their practice and other health providers.

### **1. View on process**

What do you think of this approach to pre-diabetes to pre-diabetes screening and management?

### **2. Identification of at-risk patients**

How do you currently identify which patients are at-risk for diabetes in your practice?

Are there any barriers to identifying at-risk patients?

Is it possible to increase the risk factor identification of patients in your practice?  
How?

### **3. Waist circumference**

Waist circumference is a convenient and simple measure which is unrelated to height, correlates closely with Body Mass Index (BMI) and the ratio of waist to hip circumference and is an index of intra-abdominal fat mass and total body fat.

Do you think the use of waist circumference would be helpful in your practice for identifying patients that are at risk?

### **4a. Current screening practice**

How are patients currently screened for diabetes in your practice? *Prompt: opportunistic, planned, in-house pathology, etc*

What do you think are the barriers to diabetes screening for the practice? Facilitators?

What do you think are the barriers to diabetes screening for the patients? Facilitators?

#### **4b Potential for planned screening**

Thinking about how your practice operates currently, is it possible to increase the diabetes screening of patients in your practice? How?

Could planned diabetes screening or recall of patients with the risk factors work, if so what factors could support conducting this? *Prompt, for example-resources, staffing, routines, technology, clinics*

What are the barriers to planned screening for the practice? How could such barriers be overcome?

How can patients be encouraged to attend for screening? Are there some groups of patients you think are more/less likely to attend for screening? Is there anything else that could be done to encourage these patients?

#### **5. Diet and exercise services**

A patient that you sent for screening turns out to have “pre-diabetes.” This patient is slightly overweight and has no other significant known co-morbidities. The patient has presented to you today for their test results. What course of action do you take with this patient?

What factors impact on your decision to offer referral to diet and exercise for patients with “pre-diabetes” how do they impact on your decision?

What kinds of diet and physical activity programs are currently available for you to refer to? Are there any services lacking that are required?

What do you think is the capacity of those programs to take more people?

Thinking about how your practice operates now, what factors would help referral to diet education, weight control and physical activity programs? What would be the barriers?

The diet and nutrition referral programs will be encouraging and supporting patients to make lifestyle changes related to their diet and amount of physical activity.

What kind of programs do you think will be the most effective?

*prompt: group, one on one, allied health service, community program, self-help, home based, non-allied health with training etc*

What type of physical activity do you see as appropriate? *Prompt: fitness club membership, walking groups, yoga*

What sort of training should program leaders have?

What type of programs would you be happy to refer to or recommend? What type of programs would you not be happy to refer to or recommend? Why?

## **6. Feedback and practice follow-up visits**

After referral, do you receive feedback from the services that you refer to? *Prompt – i.e. whether they had attended, progress reports.*

Does the current level of feedback meet your needs?

If not, what type of feedback do you require?

Do you ask your patients with diabetes to attend the practice for follow up? .

What is your experience with patients attending follow-up after the diet or exercise referral?

Is there anything that what would facilitate more systematic follow-up of these patients?

## **7. Workload**

How do you see yourself managing the workload of identifying patients at risk, screening for diabetes and managing patients with pre-diabetes? For example is some of this shared with other practice staff or allied health staff?

## **8. Support**

What support do practices need most for the systematic identification and management of patients with prediabetes?

*Prompt: patient education materials, computer information systems, referral directories, education or training of GPs or staff?*

With regard to the needs of the practice, what roles can the following organisations play in supporting diabetes prevention:

- Divisions of General Practice
- Area Health Services
- Local government services
- Private allied health providers
- NGOs (like the Heart Foundation, Diabetes Australia)
- Other

**9. Focus group patient recruitment**

We will be conducting two focus groups with patients over 45 years old in order to get their perspectives on pre-diabetes screening and management. Patients will be compensated for their time and travel expenses.

Would you be prepared to have your receptionist hand an invitation to a small number of patients that are over 45 to take part in focus groups about the screening and management of “pre-diabetes”?

**10. Other**

Do you have any other comments?

## **Appendix D: Pre-intervention interviews with other health service providers and AHS managers**

**Note- questions marked \* are only asked to service providers**

The University of New South Wales is conducting this study to determine current practices and needs for the screening and management of “pre-diabetes” in general practice with the support of allied health and community services. Interviews are being conducted with GPs, practice staff, division staff, AHS, and service providers.

Pre-diabetes is a condition in which a person's blood sugar (glucose) level is above normal but below a level that indicates diabetes. Pre-diabetes has no symptoms and can only be diagnosed with a blood glucose test.

Pre-diabetes may be called impaired glucose tolerance or impaired fasting glucose, depending on the test used to diagnose it. The screening procedure includes the fasting blood sugar test, which is followed by an oral glucose tolerance test if diabetes is suspected.

Some people with pre-diabetes go on to develop type 2 diabetes later in life, and recent studies indicate that pre-diabetes increases the risk of heart disease. People with pre-diabetes may be able to prevent type 2 diabetes by making changes in their diets and increasing their levels of physical activity.

Diabetes prevention depends on patients with “pre-diabetes” (IGT, IFG) being identified opportunistically or in routine diabetes screening in general practice and managed by their practice and other health providers.

Some of the questions may not be relevant to your position, so please just answer those that you can

### **1. View on process**

What do you think of this approach of screening for and managing pre-diabetes in general practice?

### **2. Organisational roles**

In this area, what roles can Area Health Service play in supporting diabetes prevention in general practice and in the community setting?

One role the AHS may play is in encouraging patients to attend screening. Do you think this could happen, if so how could this work?

What role could the following play in supporting diabetes prevention in general practice and the community setting?

- Divisions of General Practice
- Local government services
- Private allied health providers
- Private hospitals
- NGOs (like the Heart Foundation, Diabetes Australia)
- Other

Are there other organisations/services that could play a role?

### **3. Capacity**

What do you think is the current capacity of services in this area to take on a greater patient load if screening, and therefore detection and management, of pre-diabetes was increased?

What is the current capacity of your service to take on a greater patient load?

### **4. Referral by GPs to relevant programs/services and feedback**

How do you think GPs can best encourage patients to attend relevant services?

What are the barriers to GPs referring patients?

What do you think would help GPs refer/recommend patients to your/these service/s?

\*What do you see as the difference between a referral and recommendation?

\*Do GPs **refer** patients to your service/program? Do GPs **recommend** your service/program to patients?

\*Do others (i.e. not GPs) refer or recommend to your program/service?

Does this referral/recommendation process need improvement? If so, how can this be improved?

\*Do you require additional information from the GP about the patient in order to provide more effective service?

\*Do you provide feedback on the patient to the GP? In what format?

If needed, how can communication between your service/such services and GPs be improved?

### **5. Patient participation in lifestyle programs**

What factors (facilitators and barriers) do you think are most influential to people's level of participation in these programs and their ability to make and sustain the lifestyle changes?

\*What do you think are the barriers to patients attending your/such service/s?

What do you think will help patients to attend your/such service/s?

### **6. Main factors influencing diabetes prevention**

What are the barriers to diabetes prevention in general practice and community settings?

What factors could overcome these?

*Prompt: in the form of patient education materials, computer information systems, referral directories, education or training of staff, staffing levels, more services available*

How can these be addressed?

What support do those who provide relevant services need most?

### **7. Impact of Area**

Is there anything about being in a metro/rural area or St George/Northern Rivers/Broken Hill in particular that makes screening for and managing of pre-diabetes easier or more difficult?

8. Other

**Do you have any other comments?**

## Appendix E: Pre-intervention patient focus group questions

At the moment in Australia we have screening/testing programs for cervical cancer (Pap smears), breast cancer (mammograms) or bowel cancer. These programs identify people early in the disease process before they have any symptoms, and provide them with care to prevent the disease or its complications. In this focus group we will be talking about testing (screening) patients for diabetes and pre-diabetes who do not have any symptoms of diabetes. We will also discuss treatment for people who are diagnosed with pre-diabetes.

1. Have you heard of pre-diabetes? What do you know about it?

“Pre-diabetes” means that a person’s blood sugar is higher than normal, but not as high as that of a person with diabetes. Before diabetes develops people often have higher than normal blood sugar levels. These levels are not necessarily high enough to make a person feel unwell, and not necessarily high enough to make a diagnosis of diabetes, but nonetheless, high enough to put the person at increased risk of heart disease and diabetes.

Pre-diabetes is sometimes called impaired fasting glucose or impaired glucose tolerance. Having pre-diabetes does not mean a person will definitely develop type 2 diabetes, but it does mean that they have a higher likelihood than others of developing this disease. People with pre-diabetes may be able to prevent type 2 diabetes by making changes in their diets and increasing their levels of physical activity.

2. Who do you think is at risk of developing this condition?

Screening for diabetes and pre-diabetes means testing a patient to find out if they have the condition. In some places there are screening programs to identify people who have type 2 diabetes or pre-diabetes. The test for diabetes and pre-diabetes is a fasting blood sugar test. This blood test is done after you haven’t eaten for 8 hours, usually in the morning. If diabetes is suspected, an oral glucose tolerance test is done. In this test you have your blood tested, drink a sweet drink, and have your blood tested again after 1 hour and after 2 hours.

3. How would you feel about participating in screening for pre-diabetes?
4. Who do you think is most appropriate to offer you screening? (prompt for GP)
5. What would make you more or less likely to take up the offer of screening?

Imagine that you were told by your GP that you have pre-diabetes. Your GP advises you to improve your diet and increase your physical activity and lose some weight

because of your pre-diabetes, and in order to try to prevent you from developing diabetes.

6. What would you need to help you change your diet and become more physically active? [prompt: information, referral]
  7. How would you feel about referral [group vs individual] [type of service] [cost]
  8. How would you prefer to be reminded to return to your GP for follow up?
- 

This brief survey is to help us interpret our results. Your responses will be kept anonymous, so please do not include your name.

1. Age \_\_\_\_
2. Sex  
Female Male
3. Have you had your blood sugar tested?  
Yes No Unsure
4. Have you ever been told by a doctor or nurse that you have **diabetes**?  
Yes No Unsure
5. Have you ever been told by a doctor or nurse that you have **high sugar levels in your blood or urine**?  
Yes No Unsure
6. Have you ever been told by a doctor or nurse that you have **pre-diabetes (impaired fasting glucose or impaired glucose tolerance)**?  
Yes No Unsure

## Appendix F: Post-intervention GP interviews

1. What has your experience been with the routine screening in general practice for diabetes and “pre-diabetes”?
  - a. What makes this difficult? What could make it easier?
  - b. Have your diabetes screening practices changed as a result of the project? How?
  - c. Can these changes can be sustained? Is any support needed?
  - d. What are your views on the feasibility of routine diabetes screening in general practice?
  
2. What has your experience been with educating patients with “pre-diabetes” about their condition and how they can prevent diabetes?
  - a. What makes this difficult? What could make it easier?
  - b. Have your patient education practices changed as a result of your participation in this project? How?
  - c. Can these changes be sustained? Is any support needed?
  - d. What are your views on the feasibility of patient education regarding “pre-diabetes” and diabetes prevention in general practice?
  
3. What has your experience been with referring patients with “pre-diabetes” to other services for diet/nutrition education? Physical activity?
  - a. What makes this difficult? What could make it easier?
  - b. Have your referral practices regarding diet/physical activity changed as a result of this project? How?
  - c. Can these changes be sustained? Is any support needed?
  - d. What are your views on the feasibility of patient referral for diet/exercise from general practice?
  
4. What has your experience been regarding patients participating in these diet/nutrition and exercise activity services?
  - a. What makes participation in these services difficult for patients?
  - b. What support is needed to encourage patients to participate?
  
5. Do you ask patients with “pre-diabetes” to attend the practice for a follow-up visit?
  - a. What has your experience with this been?
  - b. Is there anything that makes arranging this difficult? Could make it easier?
  - c. Have your follow-up practices for these patients changed as a result of this project?
  - d. Can these changes be sustained? Is any support needed?
  - e. What are your views on the feasibility of follow-up appointments for patients with pre-diabetes in general practice?
  
6. Overall what would you say are the main factors which may enhance or act as a barrier to diabetes prevention in general practice?
  - a. How can these be addressed?

b What support do practices need most? *Prompt: patient education materials, computer information systems, referral directories, education or training of GPs or staff*

7. Which of the resources provided did you find useful in supporting diabetes screening and management of pre-diabetes?

*Prompt: pt education, waiting room survey, motivational interviewing education session, guidelines, Division-run group*

8. What do you think are the lessons for the future regarding the support of diabetes prevention through general practice and allied health?

9. What roles should the following play in supporting diabetes prevention in general practice:

- Divisions of General Practice
- Area Health Services
- Government
  - Federal
  - State
  - Local
- Private allied health providers
- NGOs (like the Heart Foundation, Diabetes Australia)
- Other

10. Do you have any other comments?

## Appendix G: Post-intervention referral service interviews

1. What is your experience with providing education to clients with “pre-diabetes” about their condition and how diabetes can be prevented?
  - a. What makes providing this education difficult? Easier?  
*Prompt:referral*
  - b. What role do GPs play here? In your opinion could this be improved? How?
2. What is your experience with providing or coordinating diet/nutrition or physical activity programs or services for patients with “pre-diabetes”?
  - a. What makes this difficult? Easier?
  - b. How can these issues be addressed?
3. What is your experience regarding clients with pre-diabetes attending your service?
  - a. Is there anything that makes them less likely to attend? More likely to attend?
  - b. Is there anything that makes them less likely to be able to make changes to their lifestyle? More likely?
4. What has your experience been with follow-up appointments with clients with pre-diabetes?
5. What would you say are the main factors which may enhance or act as a barrier to diabetes prevention in general practice and community settings?
  - a. How can these be addressed?
  - b. What support do community health staff need most? *Prompt:patient education materials, IT, referral directories, education or training of staff?*
6. What do you think are the lessons for the future regarding the support of diabetes prevention through general practice and allied health?
7. What roles should the following play in supporting diabetes prevention in general practice:
  - Divisions of General Practice
  - Area Health Services
  - Local government services
  - Private allied health providers
  - NGOs (like the Heart Foundation, Diabetes Australia)
  - Other
8. Do you have any other comments?

## Appendix H: Post-intervention patient surveys



THE UNIVERSITY OF  
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### DIABETES PREVENTION QUESTIONNAIRE

Please answer all questions as accurately as possible. Once complete, please post the survey in the provided envelope by Monday August 7th.

#### A. Your General Practice

1. Has your GP or practice nurse told you:

1a. that you have 'pre-diabetes\*'?  No  Yes  Unsure

1b. that you are at risk of diabetes?  No  Yes  Unsure

*\*'pre-diabetes' may also have been called 'high blood sugar', 'impaired fasting glucose', or 'impaired glucose tolerance'*

2a. Has your GP or practice nurse told you what "pre-diabetes" is?  No  Yes  Unsure

2b. Has your GP or practice nurse provided you with any **information** on how you can decrease your chance of developing diabetes?  No  Yes  Unsure

*If you do not think you have been provided with information, please go to question 4a.*

3a. If you received information from your GP or practice nurse, how did it help your **understanding of pre-diabetes and preventing diabetes**?

Not at all helpful  Somewhat unhelpful  Neither helpful/unhelpful  Somewhat helpful  Very helpful

3b. How could this **information** have been improved? \_\_\_\_\_

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4a. Has your GP suggested that you return for **follow up** GP visits to discuss your "pre-diabetes"?  No  Yes  Unsure

4b. Have you returned for a **follow up** visit?  No  Yes  Unsure

4c. If no, why not?

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## **B. Lifestyle changes**

**In the past 4 months:**

5a. Have you aimed to make any changes to your **diet and nutrition**?  No  Yes

5b. If yes, what changes have you aimed to make?

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6a. Have you been able to make any changes to your **diet and nutrition**?  No  Yes  Unsure

6b. If yes, what changes have you been able to make?

---

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7. Has there been any change to your **weight**?  
 No change  Yes, I gained weight  Yes, I lost weight  Unsure

8a. Have you aimed to increase your **physical activity**?  No  Yes

8b. If yes, what changes have you aimed to make?

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9a. Have you been able to make any changes to your **physical activity**?  No  Yes  Unsure

9b. If yes, what changes have you been able to make?

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## **C. Referral services**

10. Were you offered referral to a **diet/nutrition or physical activity service** by your GP?  
(tick all that apply)

- Yes to a group diet/exercise program (4 Lifestyle Sessions in Hurstville)
- Yes to a private dietician
- Yes to a public dietician (at the hospital)
- Yes to a private exercise physiologist
- Yes to a public exercise physiologist (at the hospital)
- Yes to a group exercise class
- No, I was not offered referral for diet or physical activity
- Unsure

***If your answer to Q10 is "no" go to question 22a***

11a. Did you attend the **diet or physical activity service** that your GP referred you to?  No  Yes

11b. If no, why

not? \_\_\_\_\_

\_\_\_\_\_

12. Was there anything that made it difficult for you to attend the **diet/nutrition or physical activity referral**?

\_\_\_\_\_

\_\_\_\_\_

13. Was there anything that did or could have made it easier for you to attend the **diet/nutrition or physical activity referral**?

\_\_\_\_\_

\_\_\_\_\_

14a. How would you rate the quality of the **diet/nutrition** information and advice you received at your referral?  Did not attend diet/nutrition referral  Poor  Fair  Good  Excellent

***If your answer to 14a. is "did not attend diet/nutrition referral" go to question 18a.***

14b. How could the **diet/nutrition** service be improved? \_\_\_\_\_

\_\_\_\_\_

15. How easy/difficult was it to follow the **advice on diet and nutrition**?

Very Difficult  Somewhat difficult  Neither difficult nor easy  Somewhat Easy  Very easy

16. What, if any, factors made it difficult for you to follow the **advice on diet and nutrition**? \_\_\_\_\_

\_\_\_\_\_

17. What would make it easier for you to follow **advice on diet and nutrition**? \_\_\_\_\_

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18a. How would you rate the quality of the **physical activity** information and advice you received at your referral?  Did not attend physical activity referral  Poor  Fair  Good  Excellent

*If your answer to 18a. is “did not attend physical activity referral” go to question 22a.*

18b. How could the **physical activity program** be improved? \_\_\_\_\_

---

---

19. How easy/difficult was it for you to follow the **advice on physical activity**?

Very Difficult  Somewhat difficult  Neither difficult nor easy  Somewhat Easy  Very easy

20. What, if any, factors made it difficult for you to follow the **physical activity advice**? \_\_\_\_\_

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21. What would make it easier for you to follow the **physical activity advice**? \_\_\_\_\_

---

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22a. Have you recently received any other support or education on diet/nutrition or physical activity?  
 No  Yes  Unsure

*If your answer to Q22a is “no” or “unsure” go to question 23*

22b. Please describe the additional support or education

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22c. How do you rate the additional support or education?

Not at all helpful  Somewhat unhelpful  Neither helpful/unhelpful  Somewhat helpful  Very helpful

23. Would you have attended the following diet/physical activity services if your GP had referred you for a session and you had to pay the amount indicated?

No Yes Unsure

- a. One-on-one dietician appointment \$75\*
- b. Group dietician appointment \$15
- c. One-on-one exercise physiologist appointment \$75\*
- d. Group exercise physiologist appointment \$15
- e. Combined diet and exercise group program 4 sessions/\$15each
- f. Group exercise class \$8

*\* after the first visit, subsequent visits to the one-on-one services would cost about \$50 per visit*

24a. Are you interested in taking part in any of the following activities as part of a group (tick all that apply)?

- Walking    Swimming    Gentle exercise    Strength training    Tai Chi    Other \_\_\_\_\_  
 None

24b. If interested in participating in a group activity, which time(s) could you attend (tick all that apply)?

- Weekday mornings     Weekday afternoons     Weekday evenings     Saturday afternoon

### **D. General questions**

25. How long have you been a patient of your GP?

- Less than a year     1-2 years     3-6 years     More than 6 years

26. Over the last 12 months your health has on the whole been:

- Poor     Fair     Good     Excellent

27. Do you have any long-term illness, health problem or disability which limits your daily activities or the work you can do?  No  Yes

28. Are you:  Male  Female

29. How old are you? \_\_\_\_\_ Years

30. Is English the language that you speak **most often** at home?  No  Yes

31. What is your current work status?

- Full time paid work     Part time paid work     Full time household duties     Disabled/sick  
 Retired/pensioner     Full time student     Unemployed      
 Other \_\_\_\_\_

32. What is the highest qualification you have received?

- |   |   |
|---|---|
| <input type="checkbox"/> No school certificate or other qualifications        | <input type="checkbox"/> School certificate (or equivalent) |
| <input type="checkbox"/> Higher school or leaving certificate (or equivalent) | <input type="checkbox"/> Trade apprenticeship               |
| <input type="checkbox"/> Certificate/diploma                                  | <input type="checkbox"/> University undergraduate degree or |

higher

33. Has any family member of yours been diagnosed with diabetes or been told that they are at high risk of developing diabetes?  No  Yes  Unsure

34. May we contact you by phone if any clarification to answers on this survey is needed?  No  Yes

35. Do you have any comments that you would like to add? \_\_\_\_\_

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**Thank you very much for taking the time to complete this questionnaire. Your answers and contact details will be kept strictly confidential.**

**Please place your survey inside the stamped envelope provided and post.**

## Appendix I: Case Study 1 - Solo practice

This GP found that participating in this intervention made her more aware of the number of patients that required screening and management for pre-diabetes. She reviewed records for the last three years to identify patients that had a blood glucose level in the range which indicated pre-diabetes. Generally these patients, without intervention, had a steady increase in their blood sugar level over the years, making a strong case for her to provide intervention to prevent diabetes.

Most of her patients were up to date with their diabetes screening, although there was a level of patient inconvenience expressed regarding the testing procedures. Previously she had been screening people from age 35 and older if they were overweight, which she estimated to be 40% of the practice population. Based on the guidelines provided in the intervention, this GP found the task more focused and manageable to only screen patients age 45 and older if overweight was their only risk factor. Once the patients over 45 are screened and managed, she will have the capacity to begin screening patients at a younger age.

Those with existing pre-diabetes were managed as they presented, although many overweight patients were difficult to motivate due to denial. Intervention with unmotivated patients was difficult, and this GP did not have much success motivating these patients, who often also had complex health and lifestyle issues. Having a referral service that patients with pre-diabetes could be sent to was very useful as there was no other referral service she felt she could access for them. Patients were hesitant about attending a group before the format was explained, and out of 13 patients offered referral, 8 signed up for the group, and 6 were able to attend. Those who attended and had been back to the GP provided positive feedback regarding the program. This program allowed the GP to spend less time with these patients explaining what pre-diabetes is and providing lifestyle advice because she knew that the Division program would cover this in depth.

Barriers to managing pre-diabetes that were encountered were a lack of GP awareness about pre-diabetes screening and management, a lack of patient awareness about diabetes risk and pre-diabetes, and the lack of access to allied health referral. The preferred referral would be a pre-diabetes clinic run by the diabetes clinic at the hospital, with a multidisciplinary approach, and enough resources to manage the number of patients referred, or an ongoing Division clinic.

## **Appendix J: Case Study 2 - Large practice**

Each of the four GP's indicated that taking part in the intervention had a positive impact on their pre-diabetes screening and management. The number of patients identified with new and recently diagnosed patients with pre-diabetes and the uptake of referral services varied greatly between the four GPs. This is likely due to differing levels of interest in and focus on preventive activities, as well as the number of hours worked weekly.

GPs found the patient waiting room diabetes risk test to be useful in raising patient awareness and keeping GPs focused on opportunities to screen for and discuss diabetes. Most patients had been kept up to date with fasting plasma glucose testing, and 16 patients were diagnosed with pre-diabetes during the 3 month study period. One GP tested several overweight patients who were in their 30's, and detecting pre-diabetes, provided an intervention for them.

Requesting patients to attend for a fasting test was not an issue, and the nurses could do this test at the practice, and for some patients it was combined with other required fasting blood tests to make it more convenient. It was suggested that screening recalls could have patients recalled directly to the nurse for the test, with a consultation with the GP booked when the test results are received.

Patient inconvenience with regard to the glucose tolerance test had been a major barrier for this practice, with most GPs almost never providing the test. After the education session in which the importance of using the test to determine if patients whose fasting test resulted in IFG actually had IFG, IGT or diabetes. While two GPs noted it was difficult to get patients to undergo the test, the other two said that there were no problems when the patients were requested to have it done, as long as it was explained. Four patients were detected as having diabetes via the OGTT. The three GPs whose patients these were acknowledged that prior to the intervention, diabetes in these patients would have gone undetected. While the GPs were convinced thereafter of the value in providing the test, two GPs were reluctant to offer it systematically when indicated, particularly for lower range fasting test results.

The practice nurses did not provide education regarding pre-diabetes or lifestyle. While the GPs indicated that this could be an area to examine to save the GPs time, the current workload of the nurses would need to be decreased.

The GPs found it useful to have a pre-diabetes group education to refer patients to, and had confidence in the program because it was provided by the Division. One of the GPs arranged for the receptionist to explain the group in more detail to patients with pre-diabetes, and then enrol them for the class. This arrangement saved time and was used by the other GPs as well. The practice offered referral to the group program to 13 patients, of whom 9 attended.

Prior to intervention two of the GPs did not actively follow-up patients with pre-diabetes. Since the GP and nurse education session, both indicated that they take a more aggressive approach to management and follow-up, with checking on the outcome of a referral as an additional incentive for following up patients. A functioning nurse-managed recall system is already in place at the practice, and GPs mentioned that they could add their pre-diabetes patients to the system.