Chronic disease surveillance in South Australia

Anne Taylor
Introduction

Chronic diseases are the most prevalent, costly and preventable of all health problems. The contribution of chronic diseases in the total burden of diseases has risen considerably in recent decades to replace communicable diseases as the leading cause of morbidity and mortality in developed countries. The burden placed upon the individual, the health system and the community is also expected to increase as the population ages in future decades.

Chronic diseases are defined as non-communicable diseases that have complex causes, multiple risk factors, a long latency period, and a long illness period which ultimately results in some limitation of daily living. The chronic diseases are generally regarded as cardiovascular diseases (CVD), diabetes, chronic lung disease, arthritis, musculoskeletal diseases and cancer. Conditions, such as incontinence, mental health conditions and dementia-related disorders, are often included in this definition.

Many chronic diseases share common risk and protective factors. The risk factors include the modifiable aspects associated with smoking, diet, physical activity and alcohol consumption. These risk factors are modifiable on a population basis – either by changing personal behaviours or by enforcing policy and legislative changes. While low levels of physical activity and high levels of alcohol consumption are risk factors for ill-health, the converse (ie higher levels of physical activity and lower levels of alcohol) are seen as protective factors. Other biomedical risk factors (such as hypertension and elevated cholesterol) are also important risk factors for ill-health and are commonly related to more than one chronic disease (eg diabetes and CVD).

Increasing emphasis is also being placed upon the relationship between chronic disease/conditions, risk and protective factors, and the range of social inequalities that occur across the life course. In addition, endeavours to replace the use of single focused or a ‘silos’ approach as a means to describe each disease is gradually being replaced by larger, more contextual and inclusive lifestyle approaches. South Australia (SA) is served comprehensively by the SA Cancer Registry which oversees the collection and analysis of all cases of invasive cancer diagnosed in SA. The surveillance, monitoring and epidemiological...
assessment of the other non-communicable chronic diseases, the associated risk and protective factors, and the related social and inequality measures, is primarily undertaken in SA, on a population-wide basis, by the Population Research and Outcome Studies (PROS) Unit in the Department of Health. This includes diabetes, asthma (and other respiratory conditions such as Chronic Obstructive Pulmonary Disease (COPD)), arthritis and musculoskeletal conditions, incontinence and aspects associated with mental health (e.g., psychological distress and depression). The risk factors covered by the Unit include body mass index (BMI), alcohol, smoking, physical activity, nutrition (food consumption and food insecurity), high blood pressure (HBP) and high cholesterol. Relevant indicators of socioeconomic inequality include household income, housing status, marital status, family structure and education level.

The assessment of these diseases and associated factors is undertaken on a high level indicator basis – policy, planning and health service management is undertaken by the relevant non-government agencies or other Department of Health specialised policy and planning areas. The Unit undertakes descriptive analysis to explain and predict trends in chronic diseases and associated factors, so as to inform population-wide early detection, preventive and service management efforts. Data collection for the surveillance and monitoring of non-registry based chronic diseases and associated factors are commonly undertaken by the use of population-based surveys. This is because the conditions are managed in the community (until complications necessitate more invasive treatment) and are not “counted” by other existing systems.

Methods
Following are details on the methodology and results from two systems designed to collect data on chronic disease and associated factors in SA.

The South Australian Monitoring and Surveillance System (SAMSS)

The South Australian Monitoring and Surveillance System (SAMSS) is a telephone monitoring system designed to systematically monitor the trends of chronic diseases, health related problems, associated factors and other health services issues for all ages, over time, for the South Australian health system. SAMSS is able to provide representative and timely estimates of key indicators associated with chronic diseases and risk factors for the state overall, and for each health region, by a range of social and demographic variables. Box 1 highlights the methodology associated with SAMSS.

North West Adelaide Health Study

To monitor the change in individuals and to evaluate the change along the disease continuum from no disease to disease with complications and ultimate death, the PROS Unit is involved with the North West Adelaide Health Study (NWAHS). NWAHS is providing information about chronic diseases, including diabetes, chronic lung disease, arthritis and musculoskeletal conditions, enabling more effective targeting and strategic interventions to improve health outcomes. In addition, NWAHS is able to report clinical assessed estimates rather than self-reported estimates obtained from the population surveillance systems. Box 2 highlights the NWAHS methodology.

Box 1

The South Australian Monitoring and Surveillance System (SAMSS) methodology

- 600+ randomly selected people (of all ages) are interviewed each month.
- Respondents aged less than 16 years have surrogate interviews.
- All households in SA with a telephone connected and the telephone number listed in the Electronic White Pages (EWP) are eligible for selection in the sample.
- A letter introducing the survey is sent to all selected households.
- The person with the most recent birthday is chosen for interview. There is no replacement for non-respondents.
- Up to ten call backs are made to the household to interview the selected person.
- A CATI (Computer Assisted Telephone Interviewing) system is utilised to conduct the interviews.
- The data are weighted by area (metropolitan/rural), age, gender and probability of selection in the household to represent the most recent SA population data so that the results are representative of the SA population.

Box 2

North West Adelaide Health Study methodology

- This was a biomedical cohort study of 4000+ representative adults, randomly selected from Glenelg to Gawler.
- All households with a telephone connected and the telephone number listed in the EWP were eligible for selection in the study.
- The sample was stratified into the two health regions: western Adelaide and northern Adelaide.
- A letter introducing the study and an information brochure were sent to the household of each selected telephone number.
- Within each household, the person who had their birthday last and was 18 years or older, was selected for interview and invited to attend the clinic.
- Appointments were made for participants in one of the two hospital-based clinics (The Queen Elizabeth Hospital and Lyell McEwen Health Service). Participants were sent an information folder that included a questionnaire with questions on chronic disease, alcohol consumption, physical activity levels, quality of life and socio-economic details (including highest education level, marital status, work status, country of birth and household income level).
- Age, sex, smoking status, height, weight, and whether they had ever been told they had high blood pressure or high cholesterol were asked in the recruitment telephone interview.
- At the clinic a range of assessments were made including taking blood (to test fasting plasma glucose, lipids, HbA1c), skin prick tests to common allergens, blood pressure, height and weight (to determine BMI), and spirometry lung function tests.
Results
Table 1 highlights the prevalence of self reported chronic diseases (from SAMSS) with estimates ranging from 4.2% for self-reported doctor-diagnosed osteoporosis to 22.1% for arthritis. Table 1 also highlights the prevalence of diabetes, asthma and COPD when clinical assessments were made in the NWAHS. The prevalence of diabetes (determined from fasting blood glucose levels) was 6.6% with an additional 13.8% of the participants having impaired fasting glucose (a pre-diabetes state). The prevalence of asthma (as determined by lung function tests) was 12.3% with nearly a quarter of people with asthma not previously having the condition diagnosed.

Table 1. Prevalence of chronic disease/conditions in South Australia, ages 18 years and over

<table>
<thead>
<tr>
<th>Disease</th>
<th>SAMSS (self-report) %</th>
<th>NWAHS (measured) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthritis</td>
<td>22.1</td>
<td>-</td>
</tr>
<tr>
<td>Asthma</td>
<td>13.8</td>
<td>12.3</td>
</tr>
<tr>
<td>CVD</td>
<td>5.2</td>
<td>-</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6.7</td>
<td>6.6</td>
</tr>
<tr>
<td>COPD</td>
<td>5.9</td>
<td>3.5</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>4.2</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: SAMSS (July 2002 to December 2004)

Table 2 highlights risk factor prevalence rates. Within the NWAHS cohort population, the measured rates of obesity were significantly higher, as was the prevalence of hypertension and elevated cholesterol. Within the SAMSS data-base, 59.7% of adults in SA (18+ years) have at least one risk factor (assessed by self-reported HBP, high cholesterol, no physical activity, obesity, current smoker, high long term alcohol risk and insufficient fruit and vegetable intake). Figure 1 highlights the proportion of people with no risk factors by Index of Relative Socio-Economic Disadvantage Quintile (SEIFA) and shows notable differences between high and low SEIFA categories.

Table 2. Prevalence of risk factors in South Australia, ages 18 years and over

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>SAMSS (self-report) %</th>
<th>NWAHS (measured) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI Overweight</td>
<td>36.4</td>
<td>36.6</td>
</tr>
<tr>
<td>Obese</td>
<td>18.4</td>
<td>28.0</td>
</tr>
<tr>
<td>Current smoker</td>
<td>20.0</td>
<td>-</td>
</tr>
<tr>
<td>Nutrition</td>
<td>8.6</td>
<td>40.9</td>
</tr>
<tr>
<td>5+ vegs/day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2+ fruit/day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Activity</td>
<td>19.9</td>
<td>30.9</td>
</tr>
<tr>
<td>No activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active but not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sufficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>49.1</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>18.5</td>
<td>26.8</td>
</tr>
<tr>
<td>Elevated Cholesterol</td>
<td>14.3</td>
<td>35.5</td>
</tr>
<tr>
<td>Alcohol risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short term</td>
<td>29.7</td>
<td></td>
</tr>
<tr>
<td>Long term</td>
<td>4.1</td>
<td></td>
</tr>
</tbody>
</table>

Source: SAMSS (July 2002 to December 2004)

Discussion
Availability of the chronic disease information from SAMSS and NWAHS is aimed at promoting evidence-based decision making, providing information about the impact of chronic conditions on quality of life, identifying appropriate points of intervention, and improving the planning and delivery of services to improve the health and wellbeing of people with, and at risk of, chronic disease. While the risk factor epidemiology paradigm is seen to place decreased emphasis on other influences of health, such as wealth distribution, work status and housing ownership, and other economic and socio-political dimensions of life, all need to be considered so that prevention, early detection and management programs are implemented to limit the occurrence and progression of chronic diseases in South Australia.

Figure 1: Proportion of population with no risk factors by SEIFA Index, aged 18 years and over

SEIFA 2001 Index of Relative Socio-Economic Disadvantage Quintiles (postcode level)
Source: SAMSS (July 2002 to December 2004)
The Prevention Terminology

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This paper draws heavily from a paper prepared by Colin Sindall (Department of Health and Ageing) and Judy Stratton (formerly Department of Health and Ageing). My thanks to them.

'Primary prevention', 'population health', 'primary health care', 'universal approaches', 'early intervention' – the terminology used at present in the health sector frequently causes confusion and misunderstanding. If we are to increase our efforts in the prevention of disease, especially chronic diseases as outlined in the Department of Health Strategic Directions, it would be useful to have a common framework. This paper provides some definitions for a few of the more frequently used terms.

Stratton and Sindall identify four different ways of categorising preventive measures:

1. Stages of Disease

   - For chronic, non-communicable disease there is a continuum from a disease-free state, to asymptomatic biological change, to clinical illness, impairment and disability, development of complications, and, for many conditions, ultimately death. This is illustrated in the following diagram (Figure 1). At every point along the continuum there are opportunities for prevention of the disease itself, its progression, or associated complications.

   - Figure 1: The natural history of chronic disease

   - Host Factors/Behavioural/ Psychological Determinants
   - Social/Environmental Determinants
   - Prevention

   - Disease Precursors
   - Early Stage Disease
   - Advance Disease, Injury or Complications

   - Early Detection and Early Intervention
   - Treatment, ongoing management and rehabilitation

References


