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Defining chronic conditions for primary care with ICPC-2

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Background. With the increasing prevalence of chronic conditions, there is need for a standardized definition of chronicity for use in research, to evaluate the population prevalence and general practice management of chronic conditions.

Objectives. Our aims were to determine the characteristics required to define chronicity, apply them to a primary care classification and provide a defined codeset of chronic conditions.

Methods. A literature review evaluated characteristics used to define chronic conditions. The final set of characteristics was applied to the International Classification of Primary Care-Version 2 (ICPC-2) through more specific terms available in ICPC-2 PLUS, an extended terminology classified to ICPC-2. A set of ICPC-2 rubrics was delineated as representing chronic conditions.

Results. Factors found to be relevant to a definition of chronic conditions for research were: duration; prognosis; pattern; and sequelae. Within ICPC-2, 129 rubrics were described as 'chronic', and another 20 rubrics had elements of chronicity. Duration was the criterion most frequently satisfied (98.4% of chronic rubrics), while 88.2% of rubrics met at least three of the four criteria.

Conclusion. Monitoring the prevalence and management of chronic conditions is of increasing importance. This study provided evidence for multifaceted definitions of chronicity. While all characteristics examined could be used by those interested in chronicity, the list has been designed to identify chronic conditions managed in Australian general practice, and is therefore not a nomenclature of all chronic conditions. Subsequent analysis of chronic conditions using pre-existing data sets will provide a baseline measure of chronic condition prevalence and management in general practice.

Keywords. Australia, chronic disease, classification, family practice, primary health care.

Introduction

During the last century, causes of death in Australia have changed from a predominance of infectious disease to a preponderance of chronic conditions,[1] and this trend is likely to continue. The Global Burden of Disease and Injury study estimated that in 1990, 55% of deaths worldwide were due to chronic conditions and projected that this will rise to 73% by 2020.[2] Studies estimating the prevalence of chronic conditions have been conducted both in Australia and internationally,[3,4] but results are often not comparable due to differences in the inclusion criteria used to define 'chronic'. Overseas research suggests that about two-thirds of encounters with health professionals are for the management of chronic conditions.[3]

There are ~19 000 recognized family physicians/GPs serving the 19 million people in Australia.[5] GPs act as gatekeepers to the health system and operate on a fee for service system, with 85% of the Schedule fee being paid by the Federal Government.[6] There are no patient lists, and individuals are free to visit multiple GPs and/or practices at any time. In any year, ~80% of the population see a GP at least once.[7]

In 1999, the Australian Federal Government introduced a programme to reward GPs specifically for the management of patients with 'chronic and complex care needs'. By encouraging a multidisciplinary approach, this programme aims to improve the continuity and quality of care for patients with chronic conditions.[8] Evaluation of the programme has, to date, been limited to reports of the GP uptake rates,[9,10] impediments to uptake[9,11,12] and ways in which uptake of the programme could be improved.[12]

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Despite the programme's introduction, no data are available reporting the prevalence or management of chronic conditions in the general practice patient population, and therefore the potential for application of the programme by GPs. Research into this area has been hindered by the lack of a clear definition of conditions which should be classed as chronic. The definition of chronic according to the programme is a condition that ". . .has been, or is likely to be, present for at least 6 months, or that is terminal".[6] However, duration is not the only criterion applicable to the classification of a condition as chronic.

In Australia, there are two major data sources that could provide this information. The National Health Survey (NHS), conducted ~4 yearly, is a household survey relying on patient self-report,[13] and could be used for estimates of population prevalence of chronic conditions. The BEACH (Bettering the Evaluation and Care of Health) programme, a continuous national study of general practice activity,[14] could provide data on the general practice management rates of chronic conditions. Both studies classify morbidity data according to the International Classification of Primary Care-Version 2 (ICPC-2).[15] Therefore, chronic conditions clearly need to be defined in these terms. Both studies also code morbidity data in more specific terms according to ICPC-2 PLUS, an Australian general practice terminology classified according to ICPC-2.[16]

ICPC-2 is a classification designed for primary care, developed by the World Organization of Family Doctors (Wonca). It classifies data relating to patient reasons for encounter, problems managed, non-pharmacological treatments, referrals, and orders for pathology and imaging. ICPC-2 is used in primary care across Europe[17] and in Australia.[14] The structure of ICPC-2 is shown in Table 1. In Australia, it is used with an extended vocabulary of more specific terms (classified in ICPC-2) derived from general practice.[16]

Defining the set of conditions that could be classed as chronic according to these codes and classification will allow future measurement of change in self-reported chronic condition prevalence through the NHS, and the measurement of change in their encounter prevalence and management in general practice, in terms of recent initatives for chronic and complex care in general practice, and more broadly for general practice clinical care through the BEACH study.

This study aims to define the characteristics that could be used to define chronic conditions, select those applicable to elements available in the above Australian data sources and apply the selected criteria to ICPC-2 to provide a codeset of chronic conditions for research purposes.

Methods

Literature searches were performed through Medline using combinations of terms such as 'chronic disease', 'chronic condition', 'chronic illness' and 'non-communicable disease' with terms such as 'definition', 'define' or 'defining'. Literature was also sought from

TABLE 1 *Distribution of chronic condition rubrics by ICPC-2 chapters and components*

	Chapter																	
Components	A	B	D	F	H	K	L	N	P	R	S	T	U	W	X	Y	Z	Total
1. Symptoms, complaints	1	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–	3
2. Diagnostic, screening, prevention	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3. Treatment, procedures, medication	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4. Test results	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
5. Administrative	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
6. Other	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
7. Diagnoses, disease	3	8	12	5	3	22	12	13	15	5	5	10	4	1	4	3	–	144
Partial		**1**	**3**	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**3**	**1**		**1**			
Total number of rubrics	4	9	15	6	4	24	14	14	17	6	6	13	5	1	5	3	–	147
Distribution across chapters	2.7	6.1	10.2	4.1	2.7	16.3	9.5	9.5	11.6	4.1	4.1	8.8	3.4	2.0	3.4	2.0	–	100.0
Chapter specific rate	7.8	36.0	25.9	17.1	14.3	58.5	26.4	37.8	39.5	14.0	10.3	41.9	17.9	5.1	9.4	8.3	–	–

A, general; B, blood, blood-forming; D, digestive; F, eye; H, ear; K, circulatory; L, musculoskeletal; N, neurological; P, psychological; R, respiratory; S, skin; T, metabolic, endocrine, nutritional; U, urinary, W, pregnancy, family planning; X, female genital; Y, male genital; Z, social.
Numbers in bold are counts of the number of ICPC-2 rubrics which are partially chronic, in that some conditions included in the rubric are chronic and others are not. Components 2–6 were not used for this study.

the references provided in relevant articles. Internet searches for policy statements from relevant international organizations were also conducted. The main characteristics used to define conditions as chronic in the literature were then extracted and compiled.

All possible criteria were considered in terms of their applicability to the two aforementioned research data sources. Those accepted in the final set of defining characteristics were those that could be applied to the two data sources. Each ICPC-2 rubric (defined as a 'Section or chapter heading',[18] i.e. *the label describing the concept of the code*) from the Symptom and Complaint component (Component 1) and the Diagnosis/Disease component (Component 7) was considered in terms of the final defining characteristics. Components 2–6 are process codes and were not considered.[15] Rubrics classified as chronic were required to satisfy at least three criteria, the remainder being classed as non-chronic. To improve precision, each of the ICPC-2 PLUS terms within rubrics were individually assessed for 'chronicity'. In some cases (particularly in 'rag-bag' rubrics such as 'other diseases of the . . . system'), this demonstrated that some problem labels within an individual ICPC-2 rubric could be classed as chronic and others could not. In these situations, each of the more specific ICPC-2 PLUS terms was classified independently.

Results

Characteristics of chronic conditions

The characteristics found in the literature to be indicative of chronic conditions were aetiology, duration, onset, recurrence/pattern, prognosis, sequelae, diagnosis, severity and prevalence.

Aetiology. Single causal factors may sometimes be difficult to identify in the aetiology of chronic conditions, due to the latency period between exposure and onset, and the extent of exposure to a pathogen.[19,20] In some chronic conditions, the presence of confounding factors may result in a non-linear relationship between the exposure to a pathogen and the presence of disease.[20] Such confounding factors may include exposure to behavioural risk factors, such as smoking, poor nutrition and excessive alcohol consumption,[21,22] along with genetic and environmental factors.[19]

Duration. Duration is widely used as a defining characteristic in chronic conditions. Some sources refer to chronic conditions as 'long term health conditions'.[4] However, while it is agreed that chronic conditions are of 'prolonged' duration,[21] the actual duration required for classification of a condition as chronic is a source of contention. There are three time intervals often used to define chronic conditions: 3, 6 and 12 months. The 3 month duration is given the most weight by Perrin *et al*., who, while acknowledging the shortcomings of this period, reject a longer duration of 12 months.[23] A duration of 3 months is rejected by Stein *et al*. on the basis that acute conditions with lengthy recovery periods may be inappropriately classified as chronic. They argue that assigning the criterion of 12 months duration eliminates acute conditions with lengthy recovery periods and acute recurrent conditions.[24] However, others feel that the choice of 12 months 'lacks a strong theoretical basis'.[23]

The majority of organizations who have published definitions of chronic conditions, including Wonca[25] and the Australian Institute of Health and Welfare (AIHW),[1] define the duration of chronic conditions as at least 6 months. The definition of chronic according to the Australian general practice programme for chronic and complex care also uses this time period.[6] However, this duration lacks a strong research basis. Few research studies on chronic conditions specify a 6 month duration,[26] and one suggests that duration should be a minimum of 3–6 months.[27] Further, it has been suggested that no standard duration can be applied because the duration of the condition is unique to both the condition and the person experiencing the condition.[28]

Diagnosis. Whether the diagnosis itself can be seen as a defining characteristic of chronic conditions is also a contentious issue. Some authors argue that basing definitions of chronic on diagnostic labels under-represents the prevalence of chronic conditions, as some patients may have conditions that, while meeting other criteria, are not given a chronic label.[23] Stein and Jessop found that diagnosis alone is not indicative of all perspectives of chronic conditions, and that other aspects of a condition, including the impact of that condition on the patient, need to be considered.[29]

> "The process of making a diagnosis is subject to many flaws, is often less than objective, and requires clinical judgment. There is considerable variability in the threshold of signs and symptoms used by different physicians in ascribing a label and in the actual labels used."[24]

Clarke states that, for some conditions, the differentiation between acute and chronic conditions may be made "on a precise biochemical basis" (e.g. using blood pressure readings or results of pathology). However, Clarke also acknowledges wide variability in interpretations of these readings between practitioners.[28]

Onset. The concept of onset in definitions of chronic conditions usually contains terms such as insidious and gradual.[28,30,31] While another relevant aspect of onset is age, it is recognized that chronic conditions, while

closely associated with older age groups, are not confined to the older population.[3,21,30] There is a significant amount of literature available on chronic conditions that relate to children.[23,24,29]

Recurrence/pattern. Many authors refer to the recurrent nature of a problem as a defining characteristic of chronic conditions.[21,24,28] This relates to the patterns of chronic conditions and may show considerable variation both between and within conditions. Some conditions will have a deteriorating course, while others may be episodic, with periods of remission and relapse.[24,28]

Prognosis. The poor prognosis for patients is one aspect of chronicity that comes through very strongly in the literature, with lack of certainty regarding cure, or incurability, being widely discussed.[21,23,28] Emphasis is therefore placed on managing the condition, and the maintenance of quality of life.[31]

Sequelae. Chronic conditions may produce sequelae—physical or mental consequences that are caused by, or follow the course of a condition.[32] Such sequelae may present as complications, limitations of activity, reliance on medication or technical devices, or an increased need for medical care.[24] Physical disability, or limitation of activity, is the sequela most often cited.[3,23,24] Hoffman *et al*. have stated that people with chronic conditions are at an increased risk of developing sequelae such as those previously discussed.[3] Some assert that in order to be included in a definition of chronic conditions, sequelae should impact on the patient in such a way as to affect their quality of life.[23]

Severity. The inclusion of severity as a criterion is a contentious issue in definitions of chronic conditions. The severity of a condition is experienced within the individual,[23,24] and may continually change depending on the stage of the condition.[31] Therefore, diagnosis on its own frequently is not a valid measure of severity.[24] It has been argued that conditions with little effect on the patient, in the form of either physical or mental sequelae, or conditions where, on the balance of probability, severity is not sufficient to impact on the patient's everyday functioning, should not be included in a classification of chronic conditions.[23]

Prevalence. Some researchers link criteria used to define chronic conditions with the prevalence of a particular condition, and include as chronic only those conditions with a relatively high prevalence in the population being studied.[27] This approach has been disputed by some researchers, on the basis that chronic conditions with low levels of prevalence may not be classified as such, thus underestimating the overall prevalence of chronic conditions.[23]

Selection of the criteria

It was established that, while all the abovementioned criteria were pertinent to a chronic condition definition, some criteria were irrelevant when considering the research purposes of this study. It was decided to adopt 6 months for duration since onset in our definition, partly because this will make future research comparable with the programme for the management of chronic and complex conditions in Australian general practice, and because this duration is commonly used by major data organizations.

After considering national data available for research in Australia, it was decided not to include the criteria of aetiology, onset, diagnostic label and severity in classifying chronic conditions. The concepts of aetiology and onset have little or no impact on the management of chronic conditions, which provides the focus of this study. In addition, we have no measure of severity of illness experienced by the patient in either data set. The concept of diagnosis as a characteristic of chronic conditions is complicated. The National Health Survey relies on self-reported problems, while in the BEACH programme GPs describe the 'problems managed' at the consultation. They are asked to assign the problem a label at the highest level possible on the evidence available, which may be a symptom or diagnosis. False-positive and false-negative diagnoses cannot be accounted for in either data set.

Final criteria adopted in defining chronic conditions

The following criteria were therefore adopted for the definition of chronic conditions. These conditions may:

- have a duration that has lasted, or is expected to last, at least 6 months
- have a pattern of recurrence, or deterioration
- have a poor prognosis
- produce consequences, or sequelae that impact on the individual's quality of life.

Application of chronic criteria to ICPC-2

When the above criteria were applied to each ICPC-2 PLUS term and, through these, to each ICPC-2 rubric, 127 (18.5%) of the 686 ICPC-2 symptom and diagnostic rubrics were defined as 'chronic', and a further 20 rubrics (2.9%) included some conditions classified as chronic at the PLUS level. Thus, a total of 147 rubrics (21.4%) were classified as chronic or partially chronic. The vast majority of chronic rubrics were in Component 7 ('diagnosis/disease'), only 2.0% being in Component 1 ('symptoms/complaints'). The largest proportion belonged to the circulatory system (16.3%), followed by the digestive system (10.2%), the psychological system (11.6%), and the musculoskeletal and neurological chapter (each 9.5%). The systems with the highest proportions of chronic conditions were the circulatory system (58.5% chronic), the endocrine/metabolic/nutritional system (41.9%), the

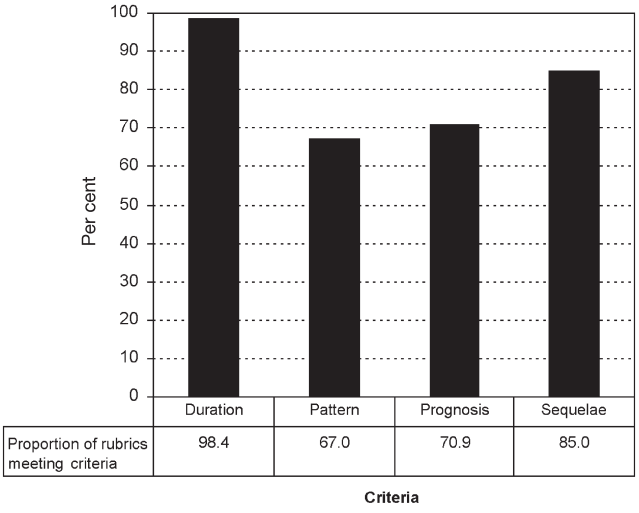

FIGURE 1 *Proportion of chronic rubrics satisfying each of the criteria*

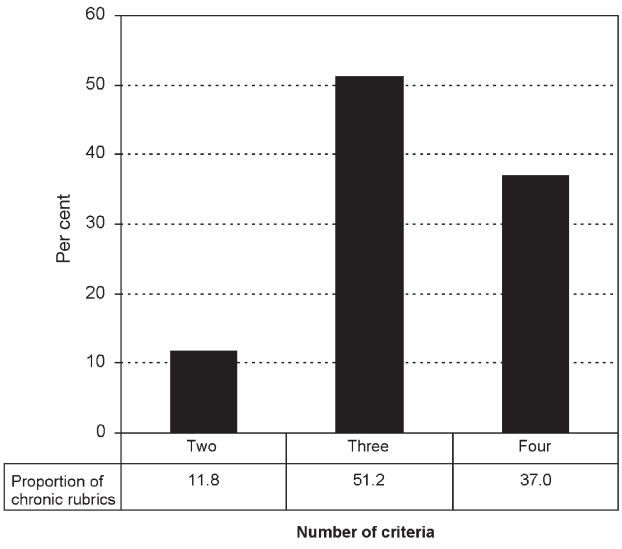

FIGURE 2 *Proportion of selected chronic rubrics that satisfy selected numbers of criteria*

neurological system (37.8%) and blood/blood-forming/immune system (36.0%) (Table 1). A full list of the rubrics classified as chronic, either in full or partially, is provided as supplementary data at http://www.fmrc.org.au/classifi.htm chronic.

Each of the four criteria were met by over half the rubrics classed as chronic. Duration was the criterion most frequently satisfied, being met by 98.4% of chronic rubrics, followed by sequelae (85.0%), prognosis (70.9%) and pattern (67.0%) (Fig. 1).

Of the rubrics classed as chronic, almost 90% satisfied at least three of the four criteria (88.2%). Over half the rubrics met three criteria (51.2%), with all four criteria being met by 37.0% of rubrics. The remainder satisfied only two of the required criteria, but were deemed worthy of inclusion on the grounds that all satisfied the duration criteria and that they had sequelae, a disease pattern or prognosis that would render their management complex in the majority of patients with the condition (Fig. 2).

Discussion

Duration is the most common, and sometimes the only, criterion used to define chronic conditions. As has been demonstrated, there currently is no standard duration used in the classification of chronic conditions. In particular, a duration of 6 months is the only criterion used to define chronic conditions eligible for payment under the package for the management of chronic conditions in Australian general practice. This study has supplied evidence supporting a multifaceted definition of chronicity. As demonstrated in Figure 1, more than two-thirds of the chronic rubrics satisfied each of the four criteria. While duration was the criterion most frequently satisfied, the high proportion of conditions meeting other criteria indicates that duration alone is an inadequate indicator of chronicity. Previous studies have suggested a combined approach of duration and sequelae to define chronic conditions.[23,24] It is interesting to note that these two criteria were the most commonly met by conditions classified as chronic.

Cardiovascular conditions comprised the largest proportion of conditions classified as chronic, and almost 60% of conditions within the cardiovascular chapter were classified as chronic. This may explain why cardiovascular conditions are the most common subject in studies of chronic conditions.

This study has a number of limitations. The final problem list was developed specifically for general practice in the Australian context, but may be valid in countries with health care systems similar to Australia. In addition, medical conditions are experienced differently in every patient. Conditions we have classified as chronic may not always manifest as chronic in all patients. Likewise, it is acknowledged that some people may have chronic conditions we have not classified as such. The list is not a nomenclature of all chronic conditions, and we acknowledge that this may underestimate the true prevalence of chronic conditions and their management in general practice.

Although there have been recent moves towards non-categorical definitions of chronic conditions,[29] this approach is not always feasible in research. Restrictions to time and resources mean that researchers must often use categorical definitions of chronic conditions, particularly in the secondary analysis of available data sources. For the current study, a combined approach has been utilized. Whilst the reviewed criteria of chronic conditions are non-categorical and can be applied by any researcher interested in chronic conditions, these criteria have been applied in a categorical manner to form a condition list.

While this study has assigned chronic conditions according to ICPC-2, this does not preclude similar research being undertaken using other classifications or coding systems, such as Read[33] or SNOMED.[34] However, due to the size of these systems, this would take considerable time.

Conclusion

Monitoring the prevalence and management of chronic conditions is of increasing importance. Ideally, these data would be derived non-categorically from patients. However, due to the limitations previously discussed, researchers sometimes have to rely on the secondary analysis of available data sets. The current study has provided a means of identifying chronic conditions using data classified according to ICPC-2. Subsequent analysis of these data will provide a baseline measure of chronic condition prevalence and management.

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