Rule of halves: implications of increasing diagnosis and reducing dropout for future workload and prescribing costs in primary care

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SUMMARY. Evidence from one practice and from the literature suggest that approximately half of most common chronic disorders are undetected, that half of those detected are not treated, and that half of those treated are not controlled: the 'rule of halves'. Workload in primary care would increase by at least 12% if all common and important chronic disorders were fully diagnosed, treated and followed up; the accompanying effects on prescribing costs would be complex, but not necessarily inflationary. The relationship between these data and the new general practitioner contract is discussed.

Keywords: unreported morbidity; patient non-compliance; workload; prescribing costs; practice organization; health service economics.

Introduction

In 1972 Wilber and Barrow,1 studying the diagnosis and treatment of hypertension in the southern United States of America, described the 'rule of halves': half of the cases were not known, half of those known were not treated and half of those treated were not controlled.

In 1968, 100% of men and 98% of women aged 20–64 years in Glyncorrwg, West Glamorgan, where there is only one general practice, were screened for raised blood pressure by a process of systematic case finding, supplemented first by invitation, then by home visits.2 This doubled the number of known and treated cases in the community. When records were audited in 1970, about half of the patients had either dropped out or were uncontrolled; the rule of halves applied. The first term of the rule was negated by screening in 1968, the second and third terms by establishing a follow-up hypertension clinic, with systematic review of default, in 1974.

For non-insulin dependent diabetes, the first term of the rule of halves was suggested in the USA in 19473 and confirmed in the United Kingdom in 1964.4 Later epidemiological studies confirmed the true prevalence of all forms of diabetes to be about 2% in UK populations,5 while general practice records generally indicated a known prevalence of 1% or less.6,7 As insulin dependent diabetes presents with severe symptomatic illness, virtually all undiagnosed diabetes is the non-insulin dependent form. Non-insulin dependent diabetes is concentrated in older age groups, in the poor8 and in Asians;9 it is therefore a larger problem in industrial and deprived areas.

In 1976 Doney9 added the second term of the rule of halves for diabetes. In a practice of 20,000, approximately half of all diabetic patients were unsupervised. The third term was established in 1980, when Wilkes and Lawton10 found that half of the diabetic patients under general practitioner supervision in Sheffield had uncontrolled levels of blood glucose.

Twenty years after the work of Wilber and Barrow1 the scale of unmet need for chronic disease should be common knowledge, but it is not.11 Despite some progress,12,13 the rule of halves still largely holds in the UK for hypertension,14 diabetes,14,16 and probably for childhood asthma diagnosed as wheezy bronchitis or night cough,17–20 and adult asthma diagnosed as chronic bronchitis or emphysema.21

There is no longer serious doubt that assiduous control of moderate or severe hypertension and non-insulin dependent diabetes is effective in preventing fatal and disabling complications, that control of reversible airways obstruction improves quality of life and can prevent heart failure, or that neglect of these disorders increases disability and premature mortality. In line with commitments to World Health Organization policy, the Department of Health has named specific health targets.22 These include a 30% reduction in the number of deaths from coronary heart disease among under 65 years olds between 1988 and the year 2000; a 33% reduction in the number of men smoking and a 30% reduction in the number of women smoking between 1990 and 2000; a 13% reduction in obesity among men and a 42% reduction among women between 1987 and 2005; and a 36% reduction in the number of men drinking above sensible limits between 1987 and 2005. None of these targets is likely to be achieved without improved diagnosis in the community and sustained treatment.

Systematic case finding and follow up

In Glyncorrwg systematic case finding for six common chronic disorders or reversible risks — high blood pressure, smoking, obesity, diabetes, fixed or reversible airways obstruction and an alcohol problem — has been carried out among all age groups since 1968.23 The cumulative prevalence of these disorders or reversible risks was more than doubled. The rule of halves probably holds for most common chronic disorders in which needs correlate poorly with symptoms, or in which fear, denial, or a bad experience of care, impede access and promote default even in freely accessible care systems.

In the 1970s the 'icberg' of undetected disease was well recognized, though not yet quantified. Contrary to the perceptions of most general practitioners working in deprived areas, Hannay and Maddox24 found that in a poor area of Glasgow, major problems that were not presented to general practitioners were two or three times more frequent than trivial problems that were presented. This and similar evidence was used not to quantify unmet need so as to tackle it, but to emphasize the futility of trying. Demand was infinite but resources were finite;25 wants exceeded needs and needs exceeded resources.26

It was generally assumed that self-referral for consultation was efficiently selective for serious illness. However, from ignorance, fear or complex social reasons, many people either do not consult at all for their most important health problems or, more commonly, present with demands which elicit short-term, symptomatic responses, rather than steps toward long-term solutions. Drop-out from continuing care may result from success ('I feel good, I do not need treatment') or from failure ('I feel bad, the treatment is no use'). Effective management of chronic disorders depends on sustained changes in the way people live, including their compliance with medication. Even when medical care is
free, as most of it still is in the National Health Service, demand is limited by patients' readiness to accept the possibility of intrusions on and changes in personal life. The price of effective medical and nursing care for chronic disorders is not so much money, as active work by patients as participating producers of health.

Implications for workload and consultation time
Based on the experience of clinics for hypertension and diabetes in Glyncorrwg, the additional staff time required for these two clinics for a total population of 2000 has been estimated as 72 hours each year for doctors (69 hours encounter time and three hours for administration), 162 hours for nurses (159 hours and three hours), 90 hours for receptionists (75 hours and 15 hours) and 12 hours for a practice manager. No attempt has been made to quantify additional workload within ordinary consultations, but the mean face-to-face medical consultation time increased from seven minutes in 1967, to eight minutes in 1970 and 10 minutes in 1985.

In the last national morbidity survey 4.0% of all consultations among patients of all ages were attributed to hypertension, 0.1% directly to smoking, 0.7% to obesity, 0.8% to diabetes, 2.3% to all chronic lower respiratory disease, and 0.1% to chronic alcohol problems; 8.0% in all.27 If other chronic conditions requiring long-term management, such as epilepsy, schizophrenia, affective psychoses, thyroid disorders and psoriasis are added, the figure rises to about 12%. This approach the 15% of general practice workload attributed to chronic illness in the large study of general practice in Manchester by Wilkin and colleagues.28 The rule of halves implies that workload for the management of chronic disorders will eventually be doubled. Therefore, if needs were actively sought and fully met, primary care workload would increase by at least 12%, probably more.

This increased caseload could not be transferred to hospital outpatient care. In outpatient clinics for patients with non-insulin dependent diabetes staff are overworked and are generally able to provide only an elementary, mainly technical and instructional rather than educational service. If this is true of diabetes, with a true prevalence of 2%, how could hospitals ever cope with patients with moderate or severe hypertension, asthma, alcohol problems or serious weight problems where the prevalence is much higher?27

Whitfield and bucks29 found that only 45% of general practitioners in Avon routinely accepted responsibility for the management of patients with moderate hypertension (diastolic pressure 110–120 mmHg), 35% for patients with non-insulin diabetes, 15% for patients with chronic obstructive airways disease, and 4% for patients with alcohol problems. Acceptance of responsibility was not associated with age or membership of the Royal College of General Practitioners. It is difficult to believe that general practitioners qualified in the past 30 years are not clinically competent to handle these common disorders. Successful management of chronic disorders depends above all on continuity, personal relationships, patients' involvement in their own care, maximizing compliance and minimizing dropout.3033 This should be easier to achieve in general practice than hospital clinics.

Few group practices organize themselves to encourage continuity. Studying three large group practices without personal lists, Freeman and Richards found that 63 out of 72 children aged 0–14 years (88%) had consulted five or more different doctors within the group over a period of six years or less.34 In older patients with a known major problem continuity was better, but the question of who actually has clinical responsibility for overall care of a patient seems to be evaded in many practices.

Average consultation time has increased from a modal four minutes in the early 1970s,35 to a modal seven minutes in the late 1980s, with less than 5% of general practitioners averaging less than six or more than 11 minutes.28 Between seven and 10 minutes, a threshold is reached where the content of a consultation can move beyond a response to symptoms, to an active search for unmet needs.3638

Implications for practice organization, staff and records
The factor limiting general practitioners' acceptance of responsibility for the continuing management of common chronic disorders is less likely to be clinical competence than available consultation time, and a willingness to extend resources by sharing responsibility and information with a wider practice team. Good record keeping is required to maintain continuity, there must be an extension beyond traditional episodic care, and emphasis must be placed on continuing education for the whole team.

The cash rewards and penalties of the new general practitioner contract39 have led to rapid changes in structure and staffing, some of them apparently designed to encourage a shift in the management of chronic disease from hospital outpatient departments to general practice. Innovative general practitioners have long recognized that much outpatient follow-up care is unnecessary,40 but shifting responsibility back to general practice, without ensuring that appropriate changes in staffing, organization, and postgraduate education are already under way can be disastrous.1014

A central feature of the new contract is the health promotion clinic, but it is not clear whether these clinics are intended mainly for detection of disease, a relatively small problem, or follow up, a huge task. An advantage of such clinics is that staff can be used efficiently and work can be planned. Almost three out of four practices now have a practice manager, 88% employ one or more practice nurses, and 94% run health promotion clinics.41 Clinics should improve detection rates, and may encourage active follow up and recall, but unless consultation time with the general practitioner is extended and continually improved, they are unlikely to tackle the problems of chronic disorders effectively.

As the work of health promotion clinics is defined by providers rather than patients, protocols can be maintained relatively easily, but it is correspondingly more difficult for patients in lower social classes to modify advice to fit their own perceptions and needs, since such advice is still generally based on the experience and assumptions of patients in higher social classes.42 Such clinics are therefore most difficult to establish and least productive in precisely those communities most in need of planned anticipatory care.4346 They can be established, even in deprived inner city communities, but only by involving patients who are generally opposed to marketed care.47

Implications for information systems
The information generated by health promotion clinics can be integrated with ordinary patient-initiated consultations, but integration will not occur unless it is consciously worked for, with structured record systems that permit easy entry and retrieval. The Lloyd George record, essentially unchanged since 1916, cannot accommodate structured information on the scale required. Seventeen years after the introduction of A4 records into general practice,48 less than 5% of practices in England and Wales use them (personal communication) and the Department of Health has no plans to encourage their use.

By 1991 an estimated 60% of practices will have a computer,39 but this does not of itself solve this problem. Com-
Implications for prescribing costs

Table 1 shows per capita prescribing costs in Glyncorrwg for all prescriptions for cardiovascular medications, for drugs acting on the lower respiratory tract, and for antibiotics, compared with all general practitioners in West Glamorgan for the period since the systematic case finding policy began in the Glyncorrwg practice.

Most of the cardiovascular medication prescribed in Glyncorrwg was for hypertension and angina. Doubling the number of patients known to have cardiovascular conditions might have been expected to double treatment costs, but in fact the costs in Glyncorrwg were substantially less than in neighbouring practices. A high but planned workload encouraged a more critical attitude to criteria for diagnosis and selection of drugs.

Recognition and treatment of airways obstruction has increased, which has raised costs, but this has been accompanied by reduced prescribing of antibiotics, which has lowered costs. Treatment was mainly by inhaled steroids rather than the cheaper beta-agonists. Prescription of antibiotic medication for 'chronic bronchitis' has almost disappeared. As other general practitioners in West Glamorgan moved toward the same pattern of diagnosis and treatment, the differences diminished. This new pattern of diagnosis will increase the pharmaceutical market quantitatively, but more thoughtful management protocols will change its composition qualitatively.

Table 1. Per capita prescribing costs in Glyncorrwg as a percentage of per capita costs in West Glamorgan in October 1983, 1985 and 1989.

<table>
<thead>
<tr>
<th>Year</th>
<th>All prescriptions</th>
<th>Cardiovascular drugs</th>
<th>Drugs acting on lower respiratory tract</th>
<th>Antibiotics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>-27</td>
<td>-26</td>
<td>61</td>
<td>-75</td>
</tr>
<tr>
<td>1985</td>
<td>+1</td>
<td>-14</td>
<td>144</td>
<td>-20</td>
</tr>
<tr>
<td>1989</td>
<td>-14</td>
<td>-39</td>
<td>+19</td>
<td>-10</td>
</tr>
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Conclusion

The data from Glyncorrwg confirm the value of clinical audit for redefinition of service needs. Health professionals who audit their own data learn to think for themselves. Awareness of the volume of unmet clinical need in local communities will increase rather than diminish awareness of the resources required for their solution. Most of these resources will have to come from the community itself, but this mobilization cannot be developed within the current time constraints of general practice consultations, or without renewed emphasis on continuity of care.

References

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RCPGP Courses and conferences

A study day organized by the College's patients liaison group for general practitioners and other primary health care workers to meet representatives of patient interest groups and together discuss how multidisciplinary teamwork can best serve patients' interests. This important topic is very timely in view of rapid developments in community care and proposals for the reorganization of primary health services. There will be medical and lay speakers and opportunities in participatory workshops to explore specific areas of innovative practice.

PGEA approval applied for. Fee for the day is £65, including lunch and papers.

Further details and an application form are available from the Corporate Development Unit, Royal College of General Practitioners, 14 Princes Gate, London SW7 1PU. Tel: 071-823 9703. Fax: 071-225 3047.