

# Performance of health providers in primary health care services in Jordan

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أداء القائمين على إيتاء الخدمات الصحية الأولية في الأردن

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**الخلاصة:** تقدمت الدراسة تحليلاً للانتفاع من الوقت لدى 111 من الأطباء والممرضات والقابلات يعملون في 62 مرفقاً من مرافق الرعاية الصحية الأولية في الأردن. وقد تم ترميز الأنشطة التي يقوم بها القائمون على إيتاء الخدمات الصحية الأولية في كل فترة دوام من خلال دراسة فترات مدتها ثلاث دقائق، وباستخدام طريقة أخذ عينة من الأنشطة مع تسجيل أوقات التماس بين المريض وبين القائمين على إيتاء الخدمات الصحية، وقد اتضح وبشكل إجمالي أن القائمين على إيتاء الخدمات الصحية يمضون ما يقرب من نصف أوقاتهم (48.7% منه) بدون عمل مثمر (بالانتظار، والاستراحة والقيام بأنشطة لا تمت للعمل بصفة) ويقضون 29.1 من أوقاتهم في أنشطة سريرية (إكلينيكية)، كما يقضون 22.1% منه في أنشطة لا علاقة لها بالعمل السريري (الإكلينيكي). ويقضي الأطباء أوقاتاً غير مثمرة وأوقاتاً يقضونها في العمل السريري (الإكلينيكي) أطول من تلك التي تقضيها الممرضات والقابلات؛ إذ يمثل انتظارهم للمرضى ما يزيد على نصف الأوقات غير المثمرة. والفترة الوسطية التي يقضيها الطبيب مع المريض 3.08 دقائق. وتوصي الدراسة بوضع نظام لتحديد المواعيد لتخفيف فترة الأوقات غير المثمرة لدى القائمين على إيتاء الرعاية الصحية، وزيادة فترات الاستشارة الطبية.

**ABSTRACT** The study analysed time utilization by a sample of 111 physicians, nurses and midwives in 62 primary health care facilities in Jordan. The providers' activity over each shift was coded at 3-minute intervals using an activity sampling technique and patient-provider contact times were recorded. Overall, health providers spent the nearly half their time (48.7%) as 'down time' (waiting, breaks and non-work related activities), with 29.1% as clinical activities and 22.1% as non-clinical work-related activities. Physicians had higher clinical and down times than nurses and midwives; waiting for patients accounted for half the down time. The mean physician-patient contact time was 3.08 minutes. An appointment system is recommended to reduce down times for health providers and increase consultation times.

## Performance des prestataires de santé dans les services de soins de santé primaires en Jordanie

**RESUME** Cette étude a analysé l'utilisation du temps par un échantillon de 111 médecins, infirmières et sages-femmes dans 62 établissements de soins de santé primaires en Jordanie. L'activité des prestataires durant chaque période de travail successive a été codée à des intervalles de 3 minutes à l'aide d'une technique d'échantillonnage des activités et le temps de contact entre le patient et le prestataire a été enregistré. Globalement, près de la moitié du temps (48,7 %) des prestataires de santé était un « temps d'inactivité » (attente, pauses et activités non liées au travail), 29,1 % de leur temps étant consacré à des activités cliniques et 22,1 % à des activités non cliniques et non liées au travail. Les médecins avaient un temps clinique et un temps d'inactivité plus élevés que les infirmières et les sages-femmes ; le temps passé à attendre les patients représentait la moitié du temps d'inactivité. Le temps de contact moyen du médecin avec le patient était de 3,08 minutes. Un système de fixation de rendez-vous est recommandé pour réduire le temps d'inactivité des prestataires de santé et augmenter le temps de consultation.

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## Introduction

In 1998, the population of Jordan was estimated at 4.755 million [1]. In the same year, Jordan spent approximately JD 454 million (US\$ 647 million) on health care services [2] which represents 9.12% of the gross domestic product. Per capita health care expenditure was approximately JD 94 (US\$ 132) [2].

A comprehensive study, '*Rationalizing staffing patterns and cost analysis of primary health care services*' was carried out in the year 2000 to assist the Jordanian Ministry of Health (MOH) in making more efficient use of available resources by identifying and analysing staffing patterns, as well as estimating and analysing the various economic and financial costs of providing services.

The objectives of this study were to analyse time utilization in primary health care by type of provider, activity, type of facility and patient volume at facilities; and measure the characteristics of provider-patient contact.

## Methods

### Background

MOH primary health care facilities in Jordan are divided into 3 categories: village clinics, primary health care centres (PHCs) and comprehensive health centres (CHCs).

The village clinic is located in a single room and a provider, usually a physician from a PHC, visits on scheduled days. A male nursing-aide assigned permanently to the clinic informs the local community of the clinic hours and organizes the waiting list for patients. The clinic also provides the necessary drugs.

The PHC offers general practice and maternal and child health care provided by physicians, nurses and a midwife. Adminis-

tration is usually performed by the physician and a secretary, with patient-based manual medical records. The most important functions of the PHC are immunization, dental care provided by a dentist and a pharmacy which supplies the most important drugs, usually according to World Health Organization recommendations.

The CHC is the highest level facility in the primary health care service, staffed by several physicians, nurses including midwives and an administration team including accounting and secretarial personnel, with a family-based manual record system. In addition to general medicine and family medicine, the CHC offers emergency services including minor surgery and specialty services provided by MOH specialists either on a permanent basis in the centre or on a rotational basis. The emphasis is on immunization, dental services, pharmacy, laboratory services and radiology.

### Selection of facilities and providers

For this study, facilities were categorized into 3 groups: low, medium and high volume based on the total number of patients seen in that year in all MOH primary health care facilities. Facilities with a number of patient visits below the 33rd and above the 66th percentiles were considered low and high volume respectively, while those falling between the 33rd and 66th percentiles were considered medium volume facilities.

The study sample was selected in simple random fashion using SPSS version 7.5 software, taking into consideration 2 variables: volume of patients (high, medium and low) and geographic distribution. The number of facilities selected out of the total of MOH primary health care facilities was 62: 12 CHCs (out of 42) and 50 PHCs (out of 336). Village clinics were excluded from this study since the services of the provid-

ers is intermittent and is supplied by the PHCs. However, village clinics were included in another paper about staffing costs [3].

A list of providers working in the sampled facilities was provided by MOH. From this list, a random sample of 111 providers was selected to be observed, representing all categories of personnel included in the study: physicians, registered nurses, practical nurses and midwives.

### Data collection

Activity sampling technique, a variation of time-motion study, was used to study the activity of health providers, using the methods and instruments provided by Family

Health International [4,5], with some variations to accommodate the conditions in Jordan. A trained observer from the same profession as the provider was located discreetly in the clinic to record the activity of the provider at regular intervals over each shift (8-hours). At exact 3-minute intervals on a buzz from a chronometer, the provider's activity was observed and coded from a list of possible activities (Table 1). For analysis, these were divided into 3 categories: clinical activities (all activities when the health care provider was with a patient, coded by visit type, and 3 other work-related activities); non-clinical activities (work-related); and down time (non-clinical, not work-related).

Table 1 Categories used for coding provider activity

Activity	Activity
<i>Clinical activities</i>	Preparing materials/equipment
With a patient: visit type	Washing hands
General practice/family physician	Work-related discussion with staff
Emergency	Work-related telephone call
Family planning	Work-related meeting
Prenatal visit	Using bathroom
Child care (curative)	Other (specify)
Health education	<i>Down time</i>
Postnatal visit	Not present when shift began
Vaccination and immunization	Waiting for supplies
Growth and development	Waiting for patients
Dental	Lunch/coffee break
Work-related activity outside the clinic	Absent from clinic for personal reason
Providing support to another provider	Personal telephone call
Talking with other patients	Meeting with personal visitors
Other (specify)	Talking with staff about non-work matters
<i>Non-clinical, work-related activities</i>	Gathering personal belongings (at end of the day)
Preparing work area	Left shift early
Filling out a patient docket	Other (specify)
General administrative tasks (paper work, mail)	<i>Do not know</i>
Waiting for consultation room to be cleaned	

A separate record was made of each contact with a patient: the start time, end time, visit type (see Table 1) and code.

To minimize inter-observer bias, and to verify and correct any mistakes in coding, one physician reviewed all forms to ensure that the final coding of activities was uniform and correct.

### Analysis

Analysis of results was carried out by using the *SPSS-X* statistical package. Analysis of variance (ANOVA) was used to assess, at the 95% confidence level, the statistical significance of differences between groups.

## Results

### Time utilization

Overall, health providers spent nearly half their time as down time (48.7%), with 29.1% as clinical time and 22.1% as non-clinical time.

Table 2 shows that there were significant differences in time utilization by type of health provider, type of facility and patient volume. Physicians had more down time (52.0%) than nurses (48.4%) and midwives (42.6%). Facilities with a low volume of patients and PHC facilities had the largest amount of down time.

In PHCs, physicians had the highest down time, accounting for 55.5% of their observed time while in CHCs it was only 41.3% of observed time (Figure 1). In CHCs, nurses had the highest down time, accounting for 48.9% of their time and only 24.9% was clinical time. Midwives had more of their time as clinical time (39.5%) than nurses and more clinical time in CHCs than in PHCs (25.4%). When all providers were considered in all facilities and not separately, no significant difference in clinical, non-clinical and down time was observed.

When down time was analysed in more detail (Table 3), waiting for patients was

Table 2 Time utilization of observed health providers by type of health provider, type of facility and volume of patients

Variable	No. of providers observed	% of observed time			P-value
		Clinical	Non-clinical	Down time	
<i>Type of health provider</i>					
Physician	49	33.0	15.0	52.0	$P < 0.001$
Midwife	24	28.4	29.1	42.6	
Nurse	38	24.6	27.0	48.4	
<i>Type of health care facility</i>					
Comprehensive	23	36.6	19.9	43.5	$P = 0.013$
Primary care	88	27.2	22.7	50.1	
<i>Patient volume of facility</i>					
Low	26	19.8	27.9	52.3	$P < 0.001$
Medium	51	30.1	19.1	50.8	
High	34	34.8	22.4	42.9	
<i>Total</i>	111	29.1	22.1	48.7	

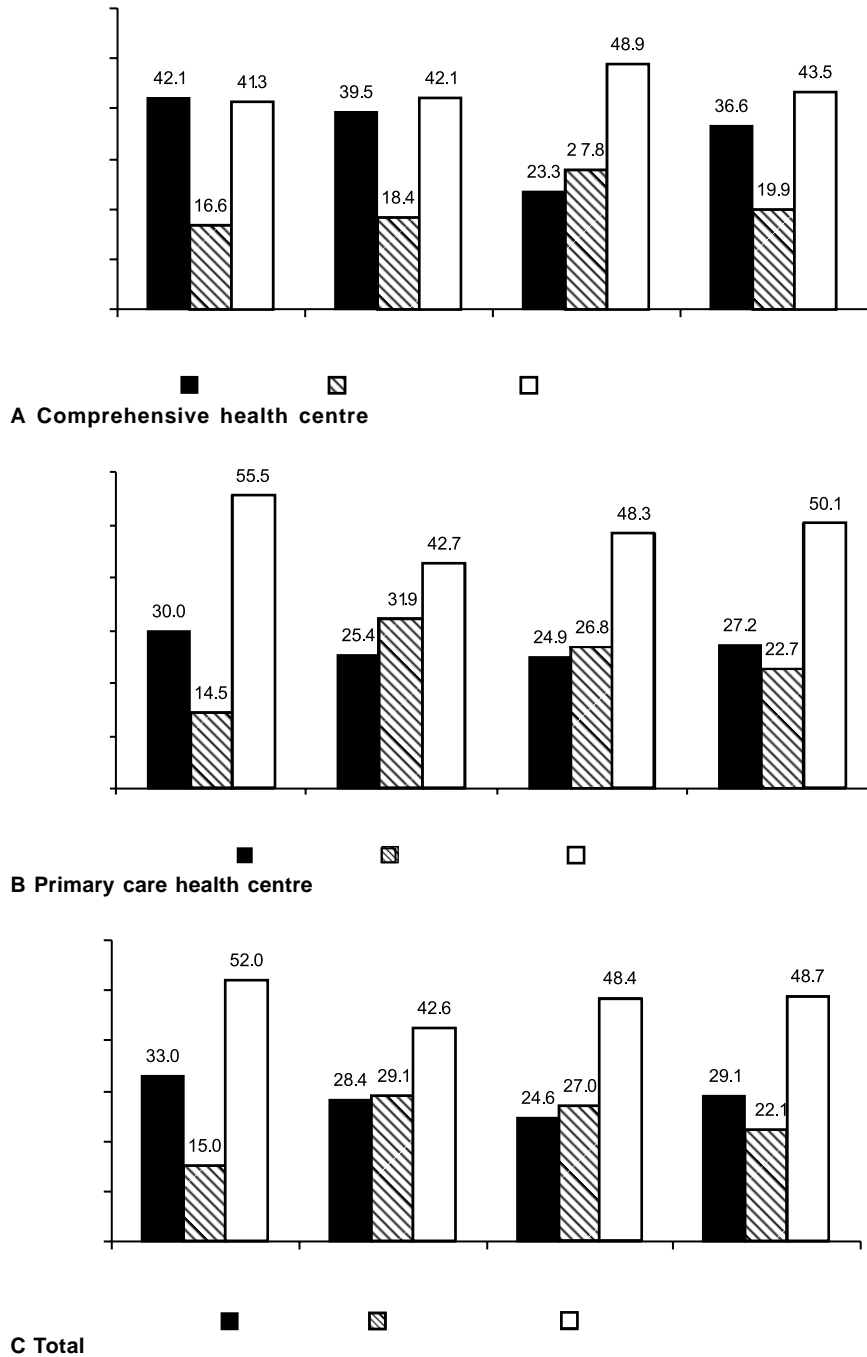


Figure 1 Distribution of observed activity time for different types of provider by type of facility

Table 3 Breakdown of down time components by type of provider

Component	% of observed down time			P-value
	Physician (n = 48)	Midwife (n = 23)	Nurse (n = 38)	
Waiting for supplies	0.1	0.0	0.2	NS
Waiting for patients	49.0	41.9	49.5	NS
Lunch/coffee break	7.1	11.9	9.1	NS
Absent from clinic for personal reason	2.0	9.6	8.4	P < 0.05
Personal telephone call	1.3	0.4	1.6	NS
Meeting with personal visitors	0.8	3.0	1.1	NS
Talking with other staff about non-work matters	8.1	17.1	11.6	P < 0.05
Gathering personal belongings (at end of the day)	3.2	6.3	4.4	P < 0.05
Left shift early	28.4	9.9	14.2	P < 0.05
Total	100.0	100.0	100.0	

NS = not significant.

n = number of providers observed.

Data missing for 1 physician and 1 midwife.

the highest component of down time for all categories of providers (nearly 50% of their down time). The next highest category was 'left shift early', which was much higher among physicians (28.4%) than midwives and nurses (only 9.9% and 14.2% of down time respectively). The next highest categories of down time were 'talking with other staff about non-work matters' and 'lunch/coffee break'. Midwives and nurses spent more of their down time than doctors being 'absent for personal reasons' and 'talking with other staff', whereas physicians were more likely than midwives and nurses to have 'left shift early' as a major part of their down time. The impact of patient volume on different components of down time was not significant

Down time was higher in PHCs than CHCs (50.1% versus 43.5%) (Table 2).

The two highest components, 'waiting for patients' and 'left the shift early' were higher in PHCs than CHCs. Down time was the highest in low volume facilities (52.3%), followed by medium and high volume facilities (50.8% and 42.9% respectively). 'Waiting for patients' was the highest category of down time in medium volume facilities, followed by high and low volume facilities. Again, 'left the shift early' was highest in low volume facilities, followed by high volume and medium volume facilities in that order.

### Patient contacts

Table 4 shows the mean contact time per patient by provider, type of facility and patient volume of facility. Midwives and nurses had significantly higher mean contact time per patient than did physicians (5.93

**Table 4 Mean patient contact time per patient by type of provider, type of facility and volume of patients**

Provider	No. of providers observed	Mean contact time per patient (min)	P-value
<i>Type of health provider</i>			
Physician	49	3.08	$P < 0.001$
Midwife	24	5.93	
Nurse	38	5.12	
<i>Type of health care facility</i>			
Comprehensive	23	4.00	$P = 0.009$
Primary care	88	3.60	
<i>Patient volume of facility</i>			
Low	26	4.85	$P < 0.001$
Medium	51	3.95	
High	34	3.22	
<i>Total</i>	111	3.72	

and 5.12 min respectively versus 3.08 min). The mean contact time between patient and provider was higher in CHCs than PHCs (4.00 versus 3.60 min), and higher in facilities with a low volume of patients than those with a high volume of visits (4.85 versus 3.22 min).

Table 5 shows the total mean contact time in hours per provider per day and the mean number of visits per day by provider. Differences in mean contact time and mean number of visits were significant ( $P < 0.001$  and  $P < 0.001$  respectively). The physicians saw a mean of 36 patients per day compared with 11 for nurses and 10 for midwives.

Table 6 shows mean contact time per patient by type of activity for all health providers. It was highest (9.93 min) for activities classified as 'Other' that included wound dressing, measurement of vital signs and intra-muscular injections. The

next highest categories were family planning (7.15 min) and prenatal visits (6.17 min). Contact times were significantly different across different activities ( $P < 0.001$ ).

**Table 5 Total mean contact time per day and mean number of visits per day by type of health provider**

Type of health provider	Total mean contact time (min)	Mean no. of visits
Physician	110.30	35.6
Midwife	58.62	9.9
Nurse	53.98	10.5
Total	60.32	21.5

$P < 0.001$ .

Table 6 Mean contact time per patient by activity in minutes for all health providers

Type of service	No. of activities observed	Mean contact time per patient (min)
Other (wound dressing, vital signs, injections, etc.)	38	9.93
Family planning	39	7.15
Prenatal visits	75	6.17
Vaccination	148	5.23
Emergency	133	5.00
Growth and development	85	4.98
Postnatal visit	62	3.23
General practice/family physician	1633	3.07

$P < 0.001$ .

## Discussion

Excess service capacity can be measured through standard time–motion studies, provider interviews, patient flow analysis, self-administered timesheets and activity sampling technique [4]. Even though activity sampling is resource-intensive and requires skilled staff, it was chosen for this study as it was considered to be the most accurate and objective method [4,5]. Due to the intrusive nature of the observation of providers of care for lengthy periods, we were unable to assess the extent of variability between the field workers. However, variability is likely to be low because of the objective nature of the codes. For example, an observer might record that the provider was consulting with a colleague about a patient; they were not required to judge the outcome of the conversation or whether the consultation was needed.

One of the most important findings of this study was the high proportion of service providers' time (almost half overall) that was down time. This varied by type of facility and provider. In PHCs, physicians' down time accounted for more than 55% of their observed time, with only 30% of time on clinical activities, whereas in CHCs they spent 42% of their observed time on clinical activities. In CHCs and PHCs, nurses spent only about one-quarter of their time on clinical activities, whereas in CHCs midwives spent almost 40% of their time on clinical activities. As to type of facility, down time was higher in PHCs than CHCs. The two highest components, 'waiting for patients' and 'left shift early' were higher in PHCs than CHCs.

The overall down time of providers was inversely related to the volume of patients attending the facility. When analysed in more detail, 'waiting for patients' was the highest in medium volume facilities, followed by high and low volume facilities. Again, 'left shift early' was the highest in low volume facilities, followed by high volume and medium volume facilities in that order. From all these results, it could be concluded that the flow of patients may be considered at the basis of all other down time components. Clinic hours are fixed by the MOH as 08.00–16.00 hours and we have reported that 90% of patients are seen in the morning between 9.00–12.00 hours [6]. A provider who does not have anything to do and remains idle is tempted to engage in activities not related to the functions of the job. It is unlikely that a provider would leave while there are patients still waiting to be seen.

Certain categories of down time are avoidable while others may be difficult to prevent. For all 3 categories of providers, waiting for patients was the highest com-



ponent of down time, the second was leaving the shift early, which was highest among physicians, (28% their down time), whereas midwives and nurses appeared to be more observant of working hours. In theory, time wasted waiting for patients could be reduced by the adoption of an appointment system to spread clients across the day. Campbell has also shown that appointment systems correlate with higher client satisfaction [7]. In Jordan, however, there may be resistance from patients, because some of the medical conditions seen in primary health care centres are, or believed by patients to be, urgent in nature and therefore patients may not be willing to wait or ask for an appointment. The health-seeking behaviour and habits of Ministry of Health clients in Jordan need further exploration before adopting an across-the-board appointment system. One solution would be to offer both systems in parallel. In relatively large health centres where several general practice clinics are operating, an appointment system can work jointly with walk-in clinics. In high-volume facilities, special clinics (e.g. for diabetes) can be operated on an appointment basis. An appointment system may be more successful in specialty clinics and conditions of a non-urgent nature such as obstetrics, well baby, family planning, diabetes, hypertension and other chronic disease clinics.

It is noteworthy that during a 1-day shift, physicians had contact with a mean of 36 patients and spent a mean of 3.08 min with each patient. Nurses saw a mean of 11 patients during the day and spent 5.12 min with each. The midwife had contact with the smallest number of patients (10 per day) and spent the longest time (5.93 min) with each patient. It seems likely that physicians' contact time with patients is too short to reach an accurate diagnosis and provide appropriate treatment, instruc-

tions, health education and proper counseling [8].

The mean contact time between patient and provider was inversely proportionate to the volume of visits in the facility. Some types of services influence the length of contact time, especially when extensive explanations or examinations that take a long time to perform are needed [5]. Overall, contact times in primary care facilities in Jordan appear to fall short of the optimum for quality care. Howie et al. [9] have shown that, when compared with short consultations (5 minutes or less), long consultations (10 minutes or more) were associated with the doctors dealing with more of the patients' psychosocial and long-term health problems, and carrying out more health promotion in the consultation. The same study also showed that patients reported greater satisfaction with longer consultations. In a survey of general practitioners in England, 72% believed that a longer time with patients would improve their standard of care and lower prescription rates [10]. A systematic review of average consultation length from studies covering the period 1966–99 concluded that when doctors spend more time with patients the consultation was more likely to include important elements of care [11]. Longer consultation times can be used to build a strong client-provider relationship, give clients time to ask questions and give providers an opportunity to educate their clients on pertinent issues.

Any change in the present primary care systems should concentrate on decreasing or eliminating the waiting time of the patients, increasing the contact time between the patient and provider and ensuring that all elements of patient satisfaction are met, especially allowing the patient to ask questions and the provider to explain the nature of the disease and its management [7].

However, changing the system does not ensure that either providers or patients will abide by the new rules. Thus, even if an appointment system is implemented which allocates a longer contact time, it is not guaranteed that a physician who is used to completing a visit within around 3 minutes will allocate 10 or 12 minutes to provide the

patient with the necessary components of quality care. This may require continuous education of professionals and sometimes retraining in management procedures. At the same time, it is imperative to conduct an intensive educational campaign to change the behavioural pattern of the community in seeking health care.

### References

1. *Statistical yearbook, 1998*. Amman, Jordan, Department of Statistics, 1999.
2. *Jordan national health accounts. Technical report no. 49*. Bethesda, Maryland, Partnerships for Health, 2000.
3. Mawajdeh S et al. Reducing health care costs by rationalizing staffing in primary care settings. *Eastern Mediterranean health journal*, 2004, 10(3):388–94.
4. Bratt JH et al. A comparison of four approaches for measuring clinician time use. *Health policy and planning*, 1999, 14(4):374–81.
5. Janowitz B et al. Excess capacity and the cost of adding services at family planning clinics in Zimbabwe. *International family planning perspectives*, 2002, 28(2):58–66.
6. Primary Health Care Initiatives project. *Rationalizing staffing patterns and cost analysis of primary health care services in Jordan*. Bethesda, Maryland, Government of Jordan and Abt Associates Inc., 2001.
7. Campbell JL. General practitioner appointment systems, patient satisfaction and use of accident and emergency services—a study in one geographical area. *Family practice*, 1994, 11(4):438–45.
8. Leon FR et al. Length of counseling sessions and the amount of relevant information exchanged: a study in Peruvian clinics. *International family planning perspectives*, 2001, 27(1):28–33.
9. Howie JG et al. Long to short consultation ratio: a proxy measure of quality of care for general practice. *British journal of general practice*, 1991, 41(343):48–54.
10. Wilson AD. Consultation length: general practitioners' attitudes and practices. *British medical journal*, 1985, 290(6478):1322–4.
11. Wilson A, Childs S. The relationship between consultation length, process and outcomes in general practice: a systematic review. *British journal of general practice*, 2002, 52(485):1012–20.