An estimation of staffing requirements in primary care in Oman using the Workload Indicators of Staffing Needs method

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Abstract

Background: Oman is a high-income country having a relatively small population scattered over large sparsely populated areas. This presents challenges to the provision of health services. It is important to ensure that all health facilities at all levels of care have the right number and skills mix of health workers to deliver quality health care.

Aims: The main aim was to develop national staffing norms to ensure adequate numbers, appropriate skills mix and equitable distribution of health professionals in primary health care (PHC) using the workload indicators of staffing needs (WISN) method.

Methods: All types of PHC services were itemized (promotive, preventive, curative, and rehabilitative and support services). We used 2014 data from the health information system and the human resources management information system to develop staffing norms using the WISN method. First we set the norms based on the national average for the activity standards, then simulated the norms in Muscat governorate, which has 32% of the population.

Results: We calculated the required numbers of GPs and specialists for PHC centres providing core as well as core and supplementary services and the expected annual outpatient attendance. The simulation showed that doctors were less workload stressed (WISN ratio 1.02) than nurses (WISN ratio 0.66) on average, although some variations between health centres were noted.

Conclusions: Additional parameters (e.g. planned new services; local disease profile; change in health policies) may be added in future to re-adjust the calculation method once the health services mapping and human resources for health profiles for each governorate is completed.

Keywords: health services, human resources, Oman, WISN, workload

Introduction

The Sultanate of Oman is a high-income country having a relatively small population of nearly four million, of which 42.2% are expatriates or non-nationals, scattered over large areas of sparsely populated settlements which present challenges to the provision of health services (1).

The Ministry of Health recognized the importance of ensuring that all health facilities at all levels of health care have the right number and skills mix of health workers to deliver quality of health care to the population served. This was stated clearly in Oman Health Vision 2050 that called for quality care and sustained health (1). As a result, the Directorate General of Planning and Studies and the Directorate General of Primary Health Care worked jointly in adapting and adjusting the workload indicators of staffing needs (WISN) method. This was developed by the World Health Organization (WHO) to develop the national standards for primary health care institutions to assist health planners and managers to appropriately recruit and distribute health workers across geographical locations and primary health care (PHC) facilities (2) and has been used by many countries in different settings (3–6). It calculates the number of health workers per health facility based on the workload by providing gap/excess between the current and required number of health workers, and it also provides a proxy measure, the WISN ratio, to assess workload pressure on health workers.

Our objective is to develop national staffing norms to ensure adequate numbers, appropriate skills mix and equitable distribution of professionals working in PHC in Oman using the WISN method. This paper describes the process of formulating the national norms and presents the key findings and some of the limitations.

Methods

First, a joint team from the Directorate General of Planning and Studies and the Directorate General of Primary Health Care listed all types of primary health care services provided currently. This list comprises 42 services that encompass promotive, preventive, curative, and rehabilitative and support services. Next, the team categorized the services into three packages of services based on the location and catchment population served. These are: core services (basic), supplementary services, and complementary services (Table 1). Hence, each health facility will provide a defined package of primary health care ser-

Table 1 List of health service packages provided at primary health care health facilities, Oman, 2014

Core (basic)	Supplementary	Complementary
Outpatient clinic	Acute care	Delivery services
Child health/vaccination	Infertility	Training facilities
Antenatal & postnatal care	Speciality clinic:	
Birth spacing	Dermatology	
Nutrition & growth monitoring	Internal medicine	
Care of the elderly	Obstetrics & gynaecology	
Counselling & health education	General surgery	
Community outreach services & activities	Orthopaedic	
School health services	Nephrology	
Mental health care	Eye care	
Noncommunicable diseases:	Ear, nose and throat (ENT)	
Diabetes & endocrinology	Screening services	
Cardiac diseases	Ultrasonography	
Asthma & chronic respiratory diseases	Physiotherapy	
Dental care	Environmental health	
Laboratory investigations		
Radiology (X-ray)		
Dispensing of drugs		
Medical records		
Triage		
Observational beds		
Ambulance service		

vices within its catchment area.

The WISN steps were followed in calculating the health service activity (activities performed by all members of the staff category and for which annual statistics are regularly collected) and the support activity (the important activities that support health service activities, performed by all members of the staff category but for which annual statistics are not regularly collected). Thus the health service activities of doctors, nurses, dentists, pharmacists, assistant pharmacists and laboratory technicians were listed, the activity standards (defined as the time necessary to perform an activity to acceptable professional standards in the local circumstances) and standard workloads (the amount of work within a health service component that one health worker can do in a year) (2) were set and calculated manually. It is worth mentioning that most the activity standards set for the health service activities of the general practitioner (GP) were 16 minutes per case, thus the team decided to take it as an average to develop the national norms. The same applied for the specialist (21 minutes per case).

The support activities for GPs were also identified (for health centres providing the core services as well as those providing core and supplementary services); the category allowance standard, defined as the allowance standard for support activities performed by all members of a staff category (2), was determined for both types of health centre (17% for centres providing core activities and 23% for centres providing core and supplementary services); The category allowance factor (a multiplier used to calculate the total number of health workers required for health service and support activities) was then calculated (2). The category allowance factor was set as minimum and maximum (i.e. 1.2 and 1.3) to suit the context of the PHC institutions in terms of service package based on the formula:

Category allowance factor = 1/[1 – (total category allowance standard/100)].

Some modifications to the WISN were made in order to ease the development of the national norms, e.g. setting the personal time allowance as 15% instead of calculating the individual allowance factor, taking the national average number of nurses per doctor at PHC level as 2.2 instead of applying the WISN for nurses, calculating the average visits per person per PHC facility per year 4.2. This average was determined using the data of the annual health report for 2014 (9 546 903 visits/2 260 705 population) (7) and linking it to the catchment population.

The PHC institutions that provide the core services are staffed by GPs, while the PHC institutions that provide both the core and supplementary services are staffed by GPs plus specialists.

Where activities are shared between two cadres (e.g. vaccination of children where the child should first see the doctor and then go to the nurse to receive the vaccination), the activity standard was divided between the two cadres according to the time spent by each cadre. The Directorate General of PHC validated the main workload components and activity standards.

The data used to calculate the staffing norms were from 2014 (7) and extracted from the computerized records of the health information system and the human resources management (HRM) information system. The calculations were based on the PHC services utilization pattern in 2014, which showed that the average annual number of visits per person per PHC facility was 4.2 (7).

Although the staffing norms were made for all cadres working at PHC institutions, the calculations displayed in the results are attributed to doctors and nurses. The team first set the norms based on the national average of the activity standards, then simulated the norms in Muscat governorate (the capital) based on 2014 annual

statistics. The WISN ratio was also calculated by dividing the current number of staff by the required number. A WISN ratio of 1.00 shows that current staffing is in balance with the staffing demands for the workload of the health facility. A WISN ratio of > 1.00 is evidence of overstaffing in relation to the workload. Conversely, a WISN ratio of < 1.00 indicates that the current number of staff is insufficient to cope with the workload (2). The smaller the WISN ratio, the greater the work pressure.

This methodology will inform human resources for health policy-makers and decision-makers and allow them to see whether the national standards are adhered to by PHC institutions.

Results

National staffing norm for doctors (GPs and specialists)

The calculated numbers of GPs and specialists for the PHC health centres providing core services as well as those providing core and supplementary services were based on the factors shown in Table 2; the averages shown are the national averages based on the 2014 annual statistics. The activity standard of the general practitioner (GP) was 16 minutes per case, while for the specialist was 21 minutes per case.

The required numbers of GPs and specialists for PHC health centres providing core as well as core and supplementary services are shown in Table 3. The expected values for annual outpatient attendance are the national averages based on the 2014 annual statistics and related to the catchment population. The average annual number of visits per person per PHC facility was 4.2 based on the PHC services utilization pattern.

National staffing norms for nurses

The joint team decided that the calculation at PHC facilities would be based on the average number of nurses per doctor at PHC level, i.e. 2.2, according to the 2014 figures (7); this is near to the average of 2.3 specified in Oman Health Vision 2050 (1). The required numbers of nurses for PHC health centres providing the core services as well as core and supplementary services are shown in Table 4. The variations in the number required were due to the catchment population in addition to the package of services provided in the health facilities.

The same method of calculation was used in the simulation for the health centres in Muscat governorate (the capital), which has 32% of the total population and encompasses the largest number of health facilities

Table 2 List of factors used to calculate numbers of GPs and specialists for primary health care centres, Oman, 2014

Factor	Time
Total working days per doctor per year (after subtracting annual leave, national holidays, etc)	212
Total working days per week	5
Working hours per day	7
Total working hours per week	35
Total working hours per year	1484
Personal time allowance[a]	15%
Average time per case for a GP (minutes)[b]	16
Average time per case for a specialist (minutes)[b]	21

[a]Includes meetings, trainings, supervision, responding to telephone calls, breaks, etc.
[b]Average time per case is the activity standard.

Table 3 The required numbers of general practitioners (GPs) and specialists for primary health care (PHC) centres providing core as well as core and supplementary services, Oman, 2014

Catchment population	Expected annual outpatient attendance for PHC core services	Total hours per year[a]	GPs required	
			Min (1.2)[b]	Max (1.3)[b]
Centres providing core services				
≤ 5000	13 514	3604	3.0	3.0
5001–10 000	27 029	7208	6.0	6.0
10 001–15 000	40 543	10 811	8.0	9.0
Centres providing core & supplementary services				
≤ 5 000	56 886	16 443	8.0	5.0
5001–10 000	68 264	19 731	9.0	6.0
10 001–15 000	79 641	23 020	11.0	7.0

[a]This was used to calculate the total number of doctors needed to carry out the expected workload per catchment area population.
[b]Category allowance factor.

Table 4 Required numbers of nurses for primary health care centres providing core and supplementary services, Oman, 2014

Catchment population	Doctors required	Nurses required	
		1.2a	1.3b
Centres providing core services			
≤ 5 000	3	8	9
5 001–10 000	6	16	18
10 001–15 000	8	21	23
Centres providing core & supplementary services			
20 001–25 000	13	34	37
25 001–30 000	15	40	44
30 001–35 000	18	48	53

[a]Category allowance factor (minimum).

[b]Category allowance factor (maximum).

compared with the other 10 governorates. A comparison of the national staffing norms for doctors and nurses with the existing staffing levels in Muscat governorate (for 2014) was made (Table 5). Overall, according to the average WISN ratio, doctors were less workload stressed (1.02) than nurses (0.66), although some variations between health centres were noticed (doctors range 0.6–2.3; nurses range 0.4–1.6).

Discussion

The WISN tool, after being adapted, was demonstrated to be useful in setting the national norms. It is also a dynamic tool whose use can be repeated on a frequent basis (depending on the availability of data) to improve the adequacy and distribution of health workers within governorate or across similar types of PHC facilities (based on the service package). The tool has been used in many countries and for different purposes. Ghana was among the pioneering countries to develop an evidenced-based staffing norm using the WISN tool (8). The overall purpose of the WISN study in Kenya was to inform development of human resources for health norms and standards (8). In Namibia, it has been applied to determine staffing requirements to rationalize staff requirements for nurses, doctors, pharmacists and pharmacist assistants (3). The pilot phase in Botswana provided an excellent opportunity to examine the total workload of the facilities using the WISN results for several health worker categories before national roll-out (8). In East Africa, the method has been used in Tanzania to determine the staffing needs for quality prenatal care for nurse officers, nurse midwives and nursing assistants (9). It was also used to calculate the staffing requirements for medical officers, nurses

and laboratory staff in Kenya (10). This method was initially used to determine the nursing staff requirements in Lacor, a private, not-for-profit hospital in Northern Uganda in 2005 (4). It has also been used in India and Bangladesh (5,11).

The application of WISN in Namibia revealed that the process is flexible and should be designed to fit the goals and scope of the WISN application (3). It was suggested that policy-makers and facility managers could use the WISN method to estimate health worker requirements for a range of needs and scenarios, including making staff adjustments in response to implementation of new services, decentralization, or reconfiguration of primary care services (3).

The simulation of the staffing norms using the 2014 data of Muscat governorate assisted in comparing the existing situation in the PHC health facilities against the national norms, and identifying the staffing equity across the governorate. It also showed an overall shortage in the number of nurses and a slight surplus for doctors although some variations between the health centres were noticed. When calculating the WISN ratio, it showed that some health centres work under great workload stress compared to others.

One of the limitations concerned the estimates that were used to calculate the required staffing; these were linked mainly to the package and pattern of health services provided to the current population, which might not be applicable to the future population. Thus the estimates will need to be frequently adjusted in line with new developments.

Conclusion

Additional parameters could be added in the future to re-adjust the calculation method once the health services mapping and human resources for health profiles for each governorate is completed. Examples of these parameters include planned new services; the trends in health services utilization pattern by different population groups; the optimal or desired level of skills mix of health workers per qualification and for each type of health facility; the local disease profile; changes in health policies (such as shifting some services from the supplementary to the core services); demographic characteristics and health needs of the population served; health workforce growth; and advances in health technology and new therapies, which sometimes alter the average time spent, e.g. for consultations or carrying out procedures.

Table 5 Status in Muscat governorate according to current situation (CS) and national primary health care (PHC) norms, 2014

Health centre	Item	Catchment area population	No. of outpatient visits	No. of doctors	No. of nurses
Siya	CS	3679	16 275	6	6
	PHC norm	≤ 5000	13 500	3	7
Mutrah	CS	19 798	47 482	15	15
	PHC norm	≤ 20 000	54 000	12	26
Ash Shaadi	CS	37 540	92 734	14	24
	PHC norm	≤ 40 000	108 000	23	50
Al Amrat	CS	19 325	77 002	15	20
	PHC norm	≤ 20 000	54 000	12	26
Al Mazari	CS	2865	14 153	5	7
	PHC norm	≤ 5000	13 500	3	7
Yiti	CS	4429	23 203	5	11
	PHC norm	≤ 5 000	13 500	3	7
Al Khawd	CS	41 145	101 934	15	27
	PHC norm	≤ 45 000	121 500	26	57
Wadi Al Arbiyin	CS	560	1118	3	3
	PHC norm	≤ 5 000	13 500	3	7
As Sifah	CS	1969	9390	3	6
	PHC norm	≤ 5 000	13 500	3	7
Bamah	CS	3416	1265	4	6
	PHC norm	≤ 5000	13 500	3	7
Al Wadi Al Kabeer	CS	17 474	42 747	13	17
	PHC norm	≤ 20000	54 000	12	26
Al Mabeela	CS	30 274	99 929	16	19
	PHC norm	≤ 35 000	94 500	20	44
Ruwi	CS	18 398	47 186	14	19
	PHC norm	≤ 20 000	54 000	12	26
As Seeb	CS	19 473	70 243	13	22
	PHC norm	≤ 20 000	54 000	12	26
Al Ghoubra	CS	31 036	59 965	16	18
	PHC norm	≤ 35 000	94 500	20	44
Al Azaiba	CS	16 086	50 107	14	23
	PHC norm	≤ 20 000	54 000	12	26
Al Wattyah	CS	27 918	58 339	14	17
	PHC norm	≤ 30000	81 000	18	40
Al Khuwayr	CS	34 055	73 448	16	24
	PHC norm	≤ 35 000	94 500	20	44
An Nahdah	CS	18 895	94 522	16	21
	PHC norm	≤ 20 000	54 000	12	26
South Al Mabeela	CS	20 244	98 106	18	22
	PHC norm	≤ 25 000	67 500	15	33
Al Mawaleh	CS	23 106	91 245	19	19
	PHC norm	≤ 25 000	67 500	15	33
Al Ansab	CS	9593	70 729	14	21
	PHC norm	≤ 10 000	27 000	6	13
Hai Al Mina	CS	6167	26 542	13	21
	PHC norm	≤ 10 000	27 000	6	13
Al Hail	CS	19 136	72 329	13	24
	PHC norm	≤ 20 000	54 000	12	26

Table 5 Status in Muscat governorate according to current situation (CS) and national primary health care (PHC) norms, 2014 (*concluded*)

Health centre	Item	Catchment area population	No. of outpatient visits	No. of doctors	No. of nurses
Muscat	CS	21 698	67 880	14	17
	PHC norm	≤ 25 000	67 500	15	33
North Al Mawaleh	CS	21 412	61 315	13	24
	PHC norm	≤ 25 000	67 500	15	33
Al Hajer	CS	9047	51 103	10	18
	PHC norm	≤ 10 000	27 000	6	13
Total	CS	469 691	1 479 188	318	453
	PHC norm			313	687
	Average WISN ratio			1.02 (318/313)	0.66 (453/687)

Workload indicators of staffing needs (WISN) ratio for each centre can be calculated by dividing the CS/PHC norm

Estimation des besoins en personnel dans les soins de santé primaires à Oman : application de la méthode des indicateurs des besoins en personnel par rapport à la charge de travail

Résumé

Contexte : Oman, un pays à revenu élevé, a une population relativement réduite, répartie sur de vastes zones faiblement peuplées. Ceci présente certaines difficultés quant à la prestation des services de santé. Il est important de faire en sorte que tous les établissements de santé, à tous les niveaux de soins, disposent d'effectifs et de compétences adéquats afin de pouvoir fournir des soins de santé de qualité.

Objectif : L'objectif principal était d'élaborer des normes de recrutement nationales afin de garantir des effectifs suffisants, une gamme de compétences adéquate et une répartition équitable des professionnels de soins de santé primaires (SSP) en se fondant sur la méthode des indicateurs des besoins en personnel par rapport à la charge de travail (méthode WISN ou *Workload Indicators of Staffing Needs*).

Méthodes : La liste détaillée de tous les types de services de SSP a été présentée (promotion, prévention, traitements, réadaptation et soutien). Nous nous sommes appuyés sur des données de 2014 tirées du système d'information sanitaire et de gestion des ressources humaines afin d'élaborer des normes de recrutement à l'aide de la méthode WISN. Nous avons d'abord défini les normes en fonction de la moyenne nationale des critères relatifs aux activités, puis nous avons simulé une mise en œuvre de ces normes dans le gouvernorat de Mascate, qui compte 32 % de la population.

Résultats : Nous avons calculé le nombre nécessaire de médecins généralistes et de spécialistes pour les centres de SSP fournissant des services de base ainsi qu'une combinaison de services de base et de services supplémentaires et nous avons calculé ce que devrait être le taux annuel de consultations ambulatoires. La simulation a montré que les médecins étaient, en moyenne, moins victimes du stress dû à la charge de travail (ratio WISN de 1,02) que les personnels infirmiers (ratio WISN de 0,66), bien que des variations d'un centre de soins à un autre aient été constatées.

Conclusions : À l'avenir, d'autres paramètres (par exemple : nouveaux services prévus ; profil local des maladies ; modifications des politiques de santé) pourront être ajoutés afin d'effectuer un nouvel ajustement de la méthode de calcul après réalisation d'une cartographie des services de santé et des ressources humaines pour chaque gouvernorat.

تقدير احتياجات التوظيف بالرعاية الصحية الأولية بعُمان باستخدام مؤشرات حِمل العمل

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الخلاصة

الخلفية: سلطنة عُمان من البلدان المرتفعة الدخل والتي فيها عدد قليل نسبيًا من السكان يتناثرون في مناطق شاسعة تقل فيها الكثافة السكانية. وهذا يطرح تحديات في توفير الخدمات الصحية. فمن الأمور الهامَّة لتقديم الرعاية الصحية العالية الجودة ضمان امتلاك جميع المرافق الصحية في جميع مستويات الرعاية للعدد الصحيح من العاملين الصحيين وتوافر المزيج الصحيح من المهارات الصحية فيها.

الهدف: كان الهدف الرئيسي لهذه الدراسة هو تطوير معايير التوظيف الوطنية التي تضمن الحصول على أعداد كافية من الموظفين وعلى مزيج مناسب من المهارات لديهم وعلى التوزيع العادل للعاملين الصحيين في مرافق الرعاية الصحية الأولية من خلال استخدام طريقة تحديد احتياجات التوظيف استنادًا إلى مؤشرات حِمْل العمل.

طرق البحث: تم توزيع جميع أنماط خدمات الرعاية الصحية الأولية ضمن أصناف (تعزيزية ووقائية وعلاجية وتأهيلية وخدمات الدعم). واستعملنا بيانات عام ٢٠١٤ المستمدة من نظام المعلومات الصحية، ومن نظام المعلومات لإدارة الموارد البشرية لوضع معايير التوظيف باستخدام طريقة تحديد احتياجات التوظيف استنادًا إلى مؤشرات حِمْل العمل. فقمنا أولاً بوضع المعايير استنادًا إلى المتوسط الوطني لمعايير الفعّاليات، ثم بمحاكاة المعايير المتبعة في محافظة مسقط، والتي تضم ٣٢٪ من السكان.

النتائج: لقد قمنا بحساب أعداد المطلوبة من الأطباء الممارسين العامين والاختصاصيين للعمل في مراكز الرعاية الصحية الأولية لتقديم الخدمات الأساسية، والخدمات الأساسية والتكميلية وللعدد المتوقع سنويًا من المراجعين للعيادات الخارجية. وأظهرت المحاكاة أن الشدة التي يعاني منها الأطباء بسبب حِمْل العمل (مقدرةً بنسبة تحديد احتياجات التوظيف استنادًا إلى مؤشرات حِمْل العمل ١,٠٢) أقل في المتوسط من تلك النسبة لدى الممرضات (٠,٦٦)، على الرغم من ملاحظة بعض الاختلافات بين المراكز الصحية.

الاستنتاجات: ويمكن في المستقبل إضافة معالم إضافية (مثل الخدمات الجديدة التي يُخَطَّط لتقديمها ومرتسم الأمراض المحلية والتغيير في السياسات الصحية) لإعادة ضبط أسلوب الحساب بمجرد استكمال وضع الخرائط للخدمات الصحية ومرتسمات الموارد البشرية الصحية لكل محافظة.

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