BMJ Open

International variations in primary care physician consultation time: a systematic review of 67 countries

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To cite: Irving G, Neves AL, Dambha-Miller H, *et al*. International variations in primary care physician consultation time: a systematic review of 67 countries. *BMJ Open* 2017;**7**:e017902. doi:10.1136/bmjopen-2017-017902

► Prepublication history and additional material for this paper are available online. To view please visit the journal (http://dx.doi.org/10.1136/bmjopen-2017-017902).

Received 25 May 2017
Revised 28 July 2017
Accepted 31 July 2017

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ABSTRACT

Objective To describe the average primary care physician consultation length in economically developed and low-income/middle-income countries, and to examine the relationship between consultation length and organisational-level economic, and health outcomes.

Design and outcome measures This is a systematic review of published and grey literature in English, Chinese, Japanese, Spanish, Portuguese and Russian languages from 1946 to 2016, for articles reporting on primary care physician consultation lengths. Data were extracted and analysed for quality, and linear regression models were constructed to examine the relationship between consultation length and health service outcomes.

Results One hundred and seventy nine studies were identified from 111 publications covering 28 570 712 consultations in 67 countries. Average consultation length differed across the world, ranging from 48 s in Bangladesh to 22.5 min in Sweden. We found that 18 countries representing about 50% of the global population spend 5 min or less with their primary care physicians. We also found significant associations between consultation length and healthcare spending per capita, admissions to hospital with ambulatory sensitive conditions such as diabetes, primary care physician density, physician efficiency and physician satisfaction.

Conclusion There are international variations in consultation length, and it is concerning that a large proportion of the global population have only a few minutes with their primary care physicians. Such a short consultation length is likely to adversely affect patient healthcare and physician workload and stress.

Strengths and limitations of this study

- As the demand for primary healthcare increases worldwide, the length of the consultation is also increasingly under pressure and there are concerns about the impact of less time with the physician.
- This is the largest international review of consultation length to date and includes six languages, 67 countries and 111 publications, which represent 28 million primary care consultations worldwide.
- Limitations of the review include the fact that differences between rural and urban, and public and private practices, were not taken into account, and the analyses rely on average consultation lengths.
- As with many comparisons of international data, the associations comparing consultation length with outcome data contained a relatively small number of data points.

BACKGROUND

Primary care-driven health systems are effective at reducing disease, mortality and promoting a more equitable distribution of health worldwide.[1] As the global population increases, the demand for primary care is also growing in both economically developed,low-income,middle-income countries. This is leading to an array of different consultation lengths, with concerns among primary care physicians worldwide about the impact of shorter consultations.[2] A recent survey of primary care physicians in Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, the UK and the USA reported that over one-third of all primary care physicians are dissatisfied with the time available per patient.[3] Surveys of primary care physicians suggest that shorter consultations compromise the care provided.[4] For example, shorter consultation length can reduce the range of services provided in primary care.[5 6] Meanwhile primary care phyisican stress scores are particularly high among slower doctors with high booking rates, with many reporting they often feel rushed at the end of the consultation.[2]

Average consultation length is also a quality indicator used by the WHO and the International Network for the Rational Use of Drugs (INRUD) to promote the safe and cost-effective use of drugs around the world. Several countries who follow the INRUD method for measuring consultation have set their own optimum consultation length as a quality standard. For example, Egypt recommends 30 min per patient as the optimum consultation length in primary care.[7] Average consultation length is also used in the primary

care monitoring tool as an outcome indicator.[8] The monitoring tool suggests that at a system level change in consultation length depends on a range of other structural and process variables such as the number of primary care physicians.[9] It is widely believed that longer consultations are better and that more primary care physicians will be required to give patients more time.[10 11] However, a Cochrane systematic review of clinical trials reported that there is insufficient evidence to say whether increasing consultation length provides patient benefit.[12] The review did, however, highlight that there is some evidence to suggest that longer consultations improve health promotion, patient enablement and the quality of record keeping. Other reviews suggest that longer consultations lead to a more accurate diagnosis of mental health problems and that time pressures can be a major barrier to treating depression.[13] There is also trial evidence that in patients with multimorbidity, longer consultations lead to an improved quality of life and patient enablement.[14 15]

It is important that the methods used by researchers to measure consultation length are representative of the true consultation length, that is, the time that doctors and patients spend together. There is a need to accurately and precisely measure consultation length and avoid systematic errors.[16] For those methods involving direct observation, researchers also need to consider how the different forms of reactivity will influence results, that is, whether knowing one is being measured affects performance, a 'Hawthorne effect'.[17] To date, only awareness of video recording has been shown *not* to influence consultation length and is considered as a reference standard for direct observation. Indirect approaches such as simply calculating the length of session and dividing it by the number of patients seen often lead to overestimation of consultation length, for example by ignoring administrative work.[18]

Yet in the face of increasing demand for primary care globally and the need for better outcomes, to date, there have been no comprehensive high-quality reviews that collate consultation lengths worldwide and examine how these relate to organisation-level economic and health outcomes. Such information remains vital if nations are to learn from each other. Previous reviews have been limited by focusing on a small number of countries, no assessment of the methods used to measure consultation length, and adopting unsystematic approaches or mixing primary and secondary care consultations.[9 19 20] The aim of this study was to undertake a systematic review of the literature to describe the average primary care physician consultation length on as wide a number of reports as we could find worldwide. We also identified methods used to measure consultation lengths, and examined the association between consultation length and organisational-level economic and health outcomes.

METHODS

We searched the following electronic databases from January 1946 to 2016: English language (Medline, Embase), Chinese (CNKI, Wanfang, VIP), Japanese (Ichushi), Russian (Yandex, Rambler), and Spanish and Portuguese (SciELO). The search strategy was based on the Medline search described by Wilson *et al* (excluding steps 24–34). Sample search strategy can be found in the online supplementary file 1. Searches were supplemented by a survey of national members from the World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians (WONCA), who were asked to search the grey literature in their respective country for evidence relating to consultation length in either English or their native language. The grey literature search also included the WHO/INRUD database (2000–2016) and Robert Graham data repository (2009–2016). One author (GI) screened all references and excluded duplicate records and those that were not eligible based on our selection criteria for considering studies. Two authors (GI and ALN) then applied the criteria to the short-listed references for full-text screening.

Study selection criteria

We included observational studies including cross-sectional studies, surveys and cohorts of consultation length with primary care physicians. Primary care physicians were defined broadly as any medically qualified physician who provides primary care. Terms for primary care physicians differ according to different settings and include general practitioners (GPs), family doctors, family practitioners and other physicians working in primary healthcare settings and who perform primary healthcare task.[12] Studies set in secondary care and randomised controlled trials were excluded.

Data extraction

One author (GI) extracted data into Excel based on study characteristics using the agreed criteria; this was then independently reviewed by another author (ALN) for consistency with disagreements resolved by discussion. Data were extracted based on the approach described by Wilson and Childs.[9] This included location, duration, design, number of consultations measured, mean consultation length, method for measuring consultation length and approach to analysis. Publicly available data were used to calculate the mean consultation length for the National Ambulatory Medical Care Survey (NAMCS). Here only data related to 'General/family physicians' were included, and the mean consultation length was calculated using the 'timemd' variable in Stata V.13.1.[21]

Quality assessment

We assessed the quality of included studies independently using the National Heart, Lung and Blood Institute (NIH) quality assessment tool for observational studies.[22] Where data were missing we attempted to contact the authors.

We did not plan to conduct a subgroup analysis and did not conduct a subgroup analysis a posteriori. Survey data were only considered reliable if they had at least 30 unweighted records and a relative SE less than 30%.

Data synthesis

Structural associations

Organisation-level rather than patient-level analysis was undertaken. Where there were at least 10 data points, trends in changes in average consultation length were described. Linear regression models were constructed to examine the association between average consultation length and (1) the number of primary care physicians per 1000 population, (2) per capita healthcare spending and (3) average consultation rate per patient per year. The data for determining the number of primary care doctors per 1000 came from the Organisation for Economic Co-operation and Development (OECD) healthcare data set and European Forum of Medical Associations membership survey.[23 24] Per capita healthcare spending data came from the World Bank, and the control variable was gross domestic product (GDP) per capita purchasing power parity in US dollar. Consultation rate came from the NIVEL primary care database.[25] Consultation rate analyses were completed using Stata V.13.1. An association was termed significant if the p value was <0.05.

Outcome associations

Age-adjusted data on hospital admission for ambulatory sensitive conditions (diabetes, asthma and chronic obstructive pulmonary disease (COPD)) per 1000 population were taken from the WHO hospital morbidity database and were adjusted for disease prevalence, the availability of hospital beds, density of primary care physician and per capita health spending. Data on patients reporting spending enough time with their regular doctor were taken from OECD report on healthcare quality indicators and were adjusted for per capita health spending. Data on burnout among family doctors were taken from a publication by Soler *et al*.[26] Chance of visiting an emergency department was taken from a publication by van den Berg *et al*[27] as part of the QALYCO-PC (Quality and Costs of Primary Care in Europe) study. Data for primary care doctors being somewhat or very dissatisfied with the time they spend with their patient were obtained from the Commonwealth Fund and were adjusted for per capita health spending.[28] Data on the patients having an X-ray, ultrasound or other scans in the last 12 months were taken from the European Union Eurobarometer.[29] An association was considered significant if the p value was <0.05.

RESULTS

Initial searches identified 1016 records, of which 838 were excluded. We included 178 studies in 111 publications. Forty-three (39%) of which were identified from the grey literature. The flow of information through our systematic review is shown in figure 1. The earliest study was in 1952 in the UK. The largest study was that by Hobbs *et al*[30], which used a data set comprising 101 818 352 from consultations in 2007–2014. The country with the largest number of studies was the USA (26), followed by Australia (16) and the UK (16).

Average length of primary care physician consultations

The average consultation length was available in 67 different countries (table 1), covering over 28 530 712 consultations. Average consultation length varied from 48 s in Bangladesh to 22.5 min in Sweden figure 2). There were 15 countries with their most recently reported consultation length at <5 min, 25 countries with a consultation length of 5–9.9 min, 11 countries with 10–14.9 min, 13 countries with a consultation length of 15–19.9 min and 3 countries with a consultation length of ≥20 min. Three countries had sufficient data points to determine long-term trends: Australia, UK and USA. In Australia consultation length was relatively stable, in the USA consultation length was increasing (by 12 s a year), and in UK consultation length was increasing (by 4.2 s a year). These trends are shown graphically in figure 3.

INRUD, International Network for the Rational Use of Drugs; SMS, short message service.

Methods used to measure consultation length

These were variable and included calculations based on electronic patient record data, estimates based on the length of session and number seen, physician surveys, observer with stopwatch, physician with stopwatch, audio tapes, video and short message service (SMS) text messages.

Quality assessment

The quality of studies was judged to be good in 40% of studies, fair in 36% and poor in 24%. The most common reason for a poor rating was a failure to clearly define the outcome measures of consultation length to ensure this measure was valid, reliable and implemented consistently across all study participants.

Structural associations

There was a statistically significant relationship between consultation length and healthcare spending per capita (p=<0.001, R^2=0.40; figure 4). This remained significant after adjusting for GDP per capita purchasing power parity (p=<0.001, R^2=0.37). There was no significant relationship between the consultation length and the number of consultations per patient per year (p=0.19, R^2=0.14). There was a statistically significant relationship between consultation length and the number of primary care physicians per 1000 population (p=<0.001, R^2=0.21; figure 5). This remained significant after adjusting for per capita health spending (p=0.001, R^2=0.24).

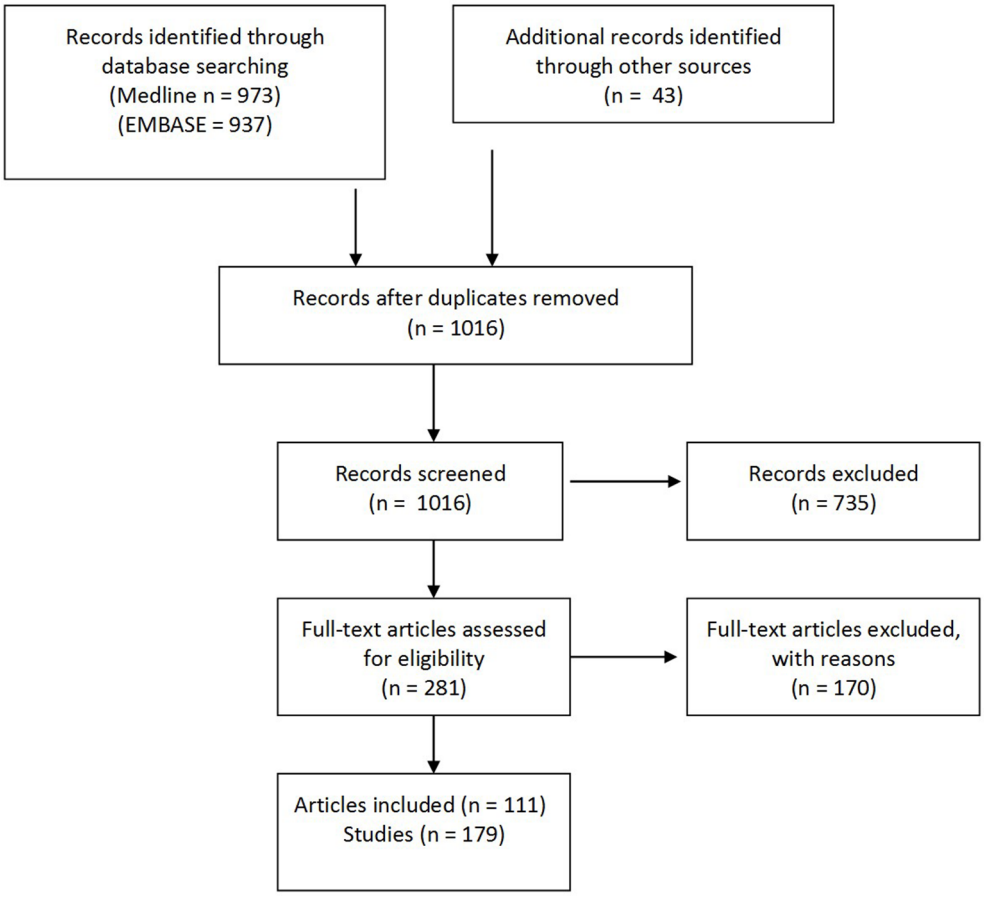

Figure 1 PRISMA flow diagram.

Outcome associations

There was a significant association between the consultation length and primary care physicians reporting being satisfied with consultation length after adjusting for health spending per capita (p=0.04, R^2=0.80, 7 observations). There was also a significant association with physician burnout relating to reduced personal accomplishment (p=0.03, R^2=0.99, 5 observations) but not emotional burnout (p=0.98, R^2=0.14, 5 observations) or depersonalisation (p=0.50, R^2=0.84, 5 observations) items after adjusting for physician density and average number of visits per patient per year. There was no significant association between the consultation length and the patients receiving an X-ray, ultrasound or other scan in the last 12 months (p=0.86, R^2=0.001, 22 observations). There was statistically significant reduction in hospital admissions for diabetes (p=0.04, R^2=0.27, 23 observations) but not asthma (p=0.30, R^2=0.17, 16 observations) or COPD (p=0.35, R^2=0.22, 11 observations). There was no significant relationship between consultation length and accident and emergency (A+E) department attendance (p=0.75, R^2=0.01, 22 observations). There was no significant association between average consultation length and patient satisfaction with consultation length after adjusting for per capita health spending and physician density (p=0.09, R^2=0.86, 7 observations).

DISCUSSION

Main findings and comparison to the literature

This review demonstrates that consultation length of primary care physicians varies markedly across the world. It is concerning that 18 countries covering ~50% of the world's population have a latest reported mean consultation length of 5 min or less. Such a short consultation length is likely to adversely affect patient care and the workload and stress of the consulting physician. The reasons for such striking differences may reflect a number of factors, including issues relating to governance, workforce, access, continuity, comprehensiveness and coordination. For example, in countries such as Pakistan, Bangladesh and China, there is no appointment system, and individual primary care physicians may undertake over 90 consultations a day with a considerable amount of time taken up providing repeat prescriptions.[10 31–33]

Many of the studies included in this review also found that short consultation length was responsible for driving polypharmacy, overuse of antibiotics and poor communication with patients.[11 32 34] This supports the argument that there is a practical limit to how short a consultation can be for routine appointments. Little can be achieved in less than 5 min unless the focus is largely on the detection and management of gross disease. An average of 5 min may be the limit below which consultations amount to little more than triage and the issue of prescriptions.

Table 1 Summary of studies included in the review

Country	Year	Method of assessing consultation length	Person measuring time	Design	Mean duration (min)	Consultations (n)	Quality
Afghanistan[42]	2009	INRUD	Unclear	Cross-sectional	3.3	100	Fair
Australia[40]	2000	Self-recorded	Doctor	Cross-sectional	14.9	31734	Good
Australia[40]	2001	Self-recorded	Doctor	Survey	15.0	36142	Good
Australia[40]	2002	Self-recorded	Doctor	Survey	14.9	35861	Good
Australia[43]	2002	Video	Researcher	Cross-sectional	14.8	926	Fair
Australia[40]	2003	Self-recorded	Doctor	Survey	15.1	32839	Good
Australia[40]	2004	Self-recorded	Doctor	Survey	15.2	31510	Good
Australia[40]	2005	Self-recorded	Doctor	Survey	15.0	34111	Good
Australia[40]	2005	Self-recorded	Doctor	Survey	14.9	33758	Good
Australia[40]	2006	Self-recorded	Doctor	Survey	15.1	35201	Good
Australia[40]	2008	Self-recorded	Doctor	Survey	14.6	34783	Good
Australia[40]	2009	Self-recorded	Doctor	Survey	15.3	33613	Good
Australia[40]	2010	Self-recorded	Doctor	Survey	15.0	32257	Good
Australia[40]	2011	Self-recorded	Doctor	Survey	15.2	33096	Good
Australia[40]	2012	Self-recorded	Doctor	Survey	14.8	31816	Good
Australia[40]	2013	Self-recorded	Doctor	Survey	14.8	31816	Good
Australia[40]	2014	Self-recorded	Doctor	Survey	14.7	33392	Good
Austria[5]	2010	Unclear	Unclear	Unclear	5	Unclear	Poor
Bahrain[44]	2007	Unclear	Unclear	Unclear	7.5	Unclear	Poor
Bangladesh[33]	1994	INRUD	Unclear	Cross-sectional	0.9	28880	Fair
Bangladesh[33]	1994	INRUD	Unclear	Cross-sectional	1	1440	Fair
Bangladesh[33]	1994	INRUD	Unclear	Cross-sectional	0.8	1440	Fair
Bangladesh[45]	1993	INRUD	Researcher	Cross-sectional	1.0	Unclear	Fair
Bangladesh[46]	2012	INRUD	Researcher	Cross-sectional	3.8	1496	Fair
Bangladesh[47]	2015	INRUD	Unclear	Cross-sectional	2.0	600	Fair
Belgium[48]	2002	Video	Researcher	Cross-sectional	15.0	601	Good
Belgium[49]	2005	Unclear	Unclear	Unclear	10–30	Unclear	Poor
Brazil[50]	2004	INRUD	Unclear	Cross-sectional	8.3	3326	Fair
Brazil[51]	1996	INRUD	Researcher	Cross-sectional	5.8	Unclear	Fair
Brazil[52]	2002	INRUD	Unclear	Cross-sectional	5.5	1456	Fair
Brazil[53]	2007	INRUD	Unclear	Cross-sectional	7.13	Unclear	Fair

Continued

Table 1 Continued

Country	Year	Method of assessing consultation length	Person measuring time	Design	Mean duration (min)	Consultations (n)	Quality
Brazil[54]	2002	INRUD	Unclear	Cross-sectional	6.13	Unclear	Fair
Bulgaria[55]	2009	Unclear	Unclear	Unclear	20	Unclear	Poor
Cambodia[56]	2002	INRUD	Unclear	Cross-sectional	4.43	60	Fair
Canada[57]	1968	Unclear	Unclear	Unclear	15.5	Unclear	Poor
Canada[58]	1969	Stopwatch	Doctor	Case series	14.8	683	Fair
Canada[59]	1989	Audio	Researcher	Cross-sectional	9	133	Fair
Canada[59]	1994	Calculation	Researcher	Cross-sectional	15.8	424	Good
China[32]	2015	Stopwatch	Researcher	Cross-sectional	2	1135	Good
Costa Rica[60]	1988	INRUD	Unclear	Cross-sectional	4.75	Unclear	Fair
Croatia[61]	2004	Self-reported	Doctor	Cross-sectional	11.5	5527	Fair
Cyprus[5]	2009	Unclear	Unclear	Unclear	15	Unclear	Poor
Denmark[5]	2009	Unclear	Unclear	Unclear	10–15	Unclear	Poor
Egypt[7]	2014	INRUD	Researcher	Cross-sectional	7.1	300	Fair
Eritrean[62]	1999	INRUD	Unclear	Cross-sectional	4	937	Fair
Estonia[63]	2003	Video	Researcher	Cross-sectional	9	405	Good
Ethiopia[64]	2011	INRUD	Unclear	Cross-sectional	5.47–6.50	322	Fair
Ethiopia[65]	1997	INRUD	Unclear	Cross-sectional	5.8	Unclear	Fair
Ethiopia[66]	2013	INRUD	Unclear	Cross-sectional	5	322	Fair
El Salvdor[19]	2013	Unclear	Unclear	Unclear	Unclear	Unclear	Poor
Finland[5]	2009	Unclear	Unclear	Unclear	20	Unclear	Poor
Finland[67]	2013	Video	Researcher	Cross-sectional	17.9	20	Good
France[68]	2002	Self-reported	Doctor	Survey	16	44 000	Fair
Germany[48]	2002	Video	Researcher	Cross-sectional	7.6	889	Good
Hong Kong Special Administrative Region[69]	1990	Unclear	Unclear	Unclear	2–3	Unclear	Poor
Hungary[5]	2009	Unclear	Unclear	Unclear	6	Unclear	Poor
Iceland[5]	2009	Unclear	Unclear	Unclear	15	Unclear	Poor
India[70]	1979	Stopwatch	Researcher	Cross-sectional	1.9	2115	Fair
India[11]	2013	Stopwatch	Unclear	Cross-sectional	2.3	412	Poor
India[71]	2015	Unclear	Researcher	Secondary analysis	2	Unclear	Poor
India[72]	2005	INRUD	Researcher	Cross-sectional	1.5	Unclear	Fair

Continued

Table 1 Continued

Country	Year	Method of assessing consultation length	Person measuring time	Design	Mean duration (min)	Consultations (n)	Quality
Indonesia[45]	1993	Unclear	Researcher	Cross-sectional	3.0	20	Fair
Indonesia[73]	1999	INRUD	Researcher	Cross-sectional	3.0	Unclear	Fair
Iran[74]	2007	INRUD/Stopwatch	Researcher	Cross-sectional	6.9	620	Good
Iraq[75]	2013	SMS	Researcher	Cross-sectional	6.3	168	Good
Israel[76]	2013	Self-reported	Doctor	Survey	7.6	77247	Good
Japan[77]	2003	Audio	Researcher	Cross-sectional	8.41	20	Fair
Japan[78]	2010	Stopwatch	Researcher	Cross-sectional	6.12	263	Fair
Japan[79]	2012	Stopwatch	Researcher	Cross-sectional	10.2	Unclear	Fair
Jordan[80]	2002	INRUD	Researcher	Cross-sectional	3.9	629	Fair
Jordan[81]	2004	INRUD	Researcher	Cross-sectional	3.07	1663	Good
Kuwait[82]	2010	INRUD	Researcher	Cross-sectional	2.8	50	Fair
Latvia[5]	2008	Unclear	Unclear	Unclear	12	Unclear	Poor
Lithuania[83]	2008	Unclear	Unclear	Unclear	15	Unclear	Poor
Luxemburg[5]	2013	Unclear	Unclear	Unclear	15–20	Unclear	Poor
Malawi[45]	1993	INRUD	Researcher	Cross-sectional	2.3	Unclear	Fair
Malawi[84]	2007	INRUD	Unclear	Cross-sectional	2.1	727	Fair
Malta[85]	2008	Unclear	Unclear	Unclear	14	Unclear	Poor
Nepal[45]	1993	INRUD	Researcher	Cross-sectional	3.5	Unclear	Fair
Nepal[86]	2012	INRUD	Unclear	Cross-sectional	2.02	109	Fair
The Netherlands[87]	1987	Video	Researcher	Cross-sectional	9.93	422	Good
The Netherlands[87]	2001	Video	Researcher	Cross-sectional	9.81	2111	Good
The Netherlands[48]	2002	Video	Researcher	Cross-sectional	10.2	579	Good
New Zealand[88]	1976	Stopwatch	Researcher	Case series	12	16	Poor
Nigeria[45]	1993	Unclear	Researcher	Cross-sectional	6.3	Unclear	Fair
Niger[89]	2001	INRUD	Unclear	Cross-sectional	5.4–6.1	Unclear	Fair
Norway[90]	1989	Self-reported	Doctor	Survey	15	Unclear	Poor
Norway[91]	2009	Self-reported	Doctor	Cross-sectional	18.3	196	Fair
Pakistan[34]	1996	Unclear	Researcher	Cross-sectional	3	996	Fair
Pakistan[92]	1995	INRUD	Unclear	Cross-sectional	4.0	Unclear	Poor
Pakistan[10]	2016	INRUD	Researcher	Cross-sectional	1.79	914	Fair
Pakistan[31]	1997	INRUD	Unclear	Cross-sectional	3.4	1639	Fair

Continued

Table 1 Continued

Country	Year	Method of assessing consultation length	Person measuring time	Design	Mean duration (min)	Consultations (n)	Quality
Peru[93]	2015	Unclear	Unclear	Unclear	15–20	Unclear	Poor
Poland[94]	2009	Stopwatch	Doctor	Survey	10.3	7924	Good
Portugal[95]	2002	Stopwatch	Doctor	Survey	14.4	274	Good
Portugal[96]	2014	Stopwatch	Medical student	Cross-sectional	15.2	155	Good
Qatar[97]	2007	Video	Researcher	Cross-sectional	6.55	598	Good
Romania[98]	2009	Video	Researcher	Cross-sectional	9.2	405	Good
Russia[99]	2014	Self-reported	Doctor	Survey	18.1	528	Poor
Russia[99]	2014	Self-reported	Doctor	Survey	17.2	701	Poor
Saudi Arabia[100]	1991	Self-reported	Doctor	Survey	5.7	843	Fair
Saudi Arabia[101]	2003	INRUD	Researcher	Cross-sectional	3.8	Unclear	Fair
Saudi Arabia[102]	2012	INRUD	Researcher	Cross-sectional	7.3	300	Fair
Saudi Arabia[103]	2015	INRUD	Researcher	Cross-sectional	16.28	200	Fair
Saudi Arabia[104]	2015	INRUD	Researcher	Cross-sectional	17.78	200	Fair
Saudi Arabia[104]	1997	INRUD	Researcher	Cross-sectional	5.94	400	Fair
Serbia[105]	2002	INRUD	Researcher	Cross-sectional	2.8–7	Unclear	Fair
Serbia[105]	2002	INRUD	Researcher	Cross-sectional	5.9	100	Fair
Serbia[105]	2002	INRUD	Researcher	Cross-sectional	6.53	100	Fair
Serbia[105]	2002	INRUD	Researcher	Cross-sectional	6.65	100	Fair
Singapore[106]	1994	Unclear	Unclear	Cross-sectional	9.3	1667	Poor
Slovakia[5]	2009	Unclear	Unclear	Unclear	4–5	Unclear	Poor
Slovenia[107]	2005	Stopwatch	Doctor	Survey	7.08	12296	Fair
Slovenia[108]	2008	Stopwatch	Nurse	Prospective survey	6.9	12501	Good
Spain[109]	1990	Unclear	Unclear	Unclear	2–5	Unclear	Poor
Spain[48]	2002	Video	Researcher	Cross-sectional	7.8	539	Good
Spain[48]	2002	Video	Researcher	Cross-sectional	7.8	539	Good
Spain[5]	2009	Survey	Unclear	Cross-sectional	13.4	Unclear	Fair
Spain[110]	1997	INRUD	Researcher	Cross-sectional	9.59	600	Fair
Spain[95]	1998	INRUD	Researcher	Cross-sectional	9.44	600	Fair
Sudan[111]	2011	INRUD	Researcher	Cross-sectional	6.3	120	Fair
Sweden[112]	1989	Stopwatch	Doctor	Cross-sectional	21	160	Fair
Sweden[113]	1992	INRUD	Researcher	Cross-sectional	22.5	48	Fair

Continued

Table 1 Continued

Country	Year	Method of assessing consultation length	Person measuring time	Design	Mean duration (min)	Consultations (n)	Quality
Switzerland[48]	2002	Video	Researcher	Cross-sectional	15.6	620	Good
Switzerland[5]	2009	Database	Researcher	Cross-sectional	17	Unclear	Poor
Tanzania[45]	1993	INRUD	Researcher	Cross-sectional	3.0	Unclear	Fair
Tanzania[114]	2006	INRUD	Researcher	Cross-sectional	3.8	Unclear	Fair
Turkey[55]	2007	Self-reported	Doctor	Survey	11	78	Poor
Turkey[115]	2008	Self-reported	Doctor	Survey	11	78	Poor
Turkey[116]	2014	Self-reported	Doctor	Survey	5	1227	Poor
Turkey[117]	2007	INRUD	Researcher	Cross-sectional	8.24	Unclear	Fair
United Arab Emirates[118]	2004	Self-reported	Doctor	Survey	5.9	925	Fair
United Arab Emirates[119]	2007	Self-reported	Doctor	Survey	5.69	Unclear	Poor
United Arab Emirates[120]	2010	INRUD	Researcher	Survey	10.7	Unclear	Fair
UK[121]	1952	Self reported	Doctor	Audit	5.0	Unclear	Poor
UK[122]	1952	Self-reported	Doctor	Audit	7.2	Unclear	Poor
UK[123]	1959	Self-reported	Doctor	Audit	8.3	Unclear	Poor
UK[124]	1964	Self-reported	Doctor	Cross-sectional	5.07	Unclear	Poor
UK[125]	1971	Self-reported	Doctor	Cross-sectional	5.2	548	Poor
UK[126]	1973	Unclear	Unclear	Cross-sectional	5.0	Unclear	Poor
UK[127]	1983	Unclear	Doctor	Audit	8.1	Unclear	Poor
UK[127]	1983	Unclear	Doctor	Audit	5.3	Unclear	Poor
UK[128]	1984	Stopwatch	Doctor	Cross-sectional	7.5	199	Fair
UK[129]	1985	Self-reported	Doctor	Survey	8.25	Unclear	Poor
UK[130]	1989	Self-reported	Doctor	Survey	9.8	76	Poor
UK[48]	2002	Video	Researcher	Cross-sectional	9.4	446	Good
UK[131]	2004	Stopwatch	Doctor	Cross-sectional	8.96	294	Fair
UK[132]	2006	Self-reported	Doctor	Survey	11.7	1317	Poor
UK[30]	2007	Calculated from record	Researcher	Cross-sectional	8.65	14 294 035	Good
UK[118]	2014	Calculated from record	Researcher	Cross-sectional	9.22	13 381 772	Good
Uganda[133]	1996	INRUD	Researcher	Cross-sectional	6	765	Fair
USA[41]	1993	Self-reported	Doctor	Survey	15.56	2053	Good

Continued

Table 1 Continued

Country	Year	Method of assessing consultation length	Person measuring time	Design	Mean duration (min)	Consultations (n)	Quality
USA[41]	1994	Self-reported	Doctor	Survey	16.77	3060	Good
USA[41]	1995	Self-reported	Doctor	Survey	16.77	3060	Good
USA[41]	1996	Self-reported	Doctor	Survey	14.94	5366	Good
USA[41]	1997	Self-reported	Doctor	Survey	16.30	3859	Good
USA[41]	1998	Self-reported	Doctor	Survey	17.51	2507	Good
USA[41]	1999	Self-reported	Doctor	Survey	17.67	3901	Good
USA[134]	1999	Audio	Researcher	Cross-sectional	15.0	7989	Good
USA[41]	2000	Self-reported	Doctor	Survey	16.20	3344	Good
USA[41]	2001	Self-reported	Doctor	Survey	16,78	2884	Good
USA[135]	2001	Audio	Researcher	Cross-sectional	11	60	Good
USA[136]	2002	Stopwatch	Nurse	Cross-sectional	9.2	876	Good
USA[136]	2002	Stopwatch	Nurse	Cross-sectional	12.1	979	Good
USA[136]	2002	Stopwatch	Nurse	Cross-sectional	9.5	2599	Good
USA[41]	2002	Self-reported	Doctor	Survey	15.77	5738	Good
USA[77]	2003	Audio	Researcher	Cross-sectional	11.14	20	Fair
USA[41]	2003	Self-reported	Doctor	Survey	17.36	4769	Good
USA[41]	2004	Self-reported	Doctor	Survey	17.61	4023	Good
USA[41]	2005	Self-reported	Doctor	Survey	18.97	4483	Good
USA[41]	2006	Self-reported	Doctor	Survey	19.91	6536	Good
USA[41]	2007	Self-reported	Doctor	Survey	18.29	7017	Good
USA[41]	2008	Self-reported	Doctor	Survey	19.77	7037	Good
USA[41]	2009	Self-reported	Doctor	Survey	18.57	7989	Good
USA[41]	2010	Self-reported	Doctor	Survey	19.3	6237	Good
USA[41]	2011	Self-reported	Doctor	Survey	20.55	6530	Good
USA[41]	2012	Self-reported	Doctor	Survey	21.07	12 897	Good
Zambia[137]	2009	INRUD	Researcher	Cross-sectional	5.8	2354	Fair
Zimbabwe[138]	2000	INRUD	Researcher	Cross-sectional	5	Unclear	Fair
Zimbabwe[135]	2002	INRUD	Researcher	Cross-sectional	8.7	Unclear	Fair

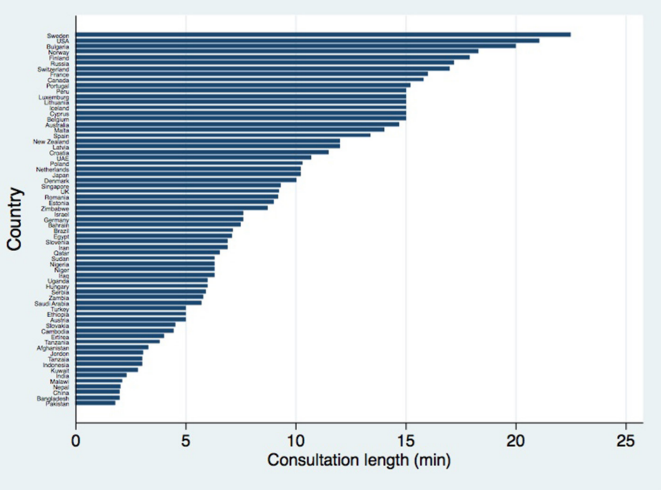

Figure 2 Average consultation length in each country based on most recent data.

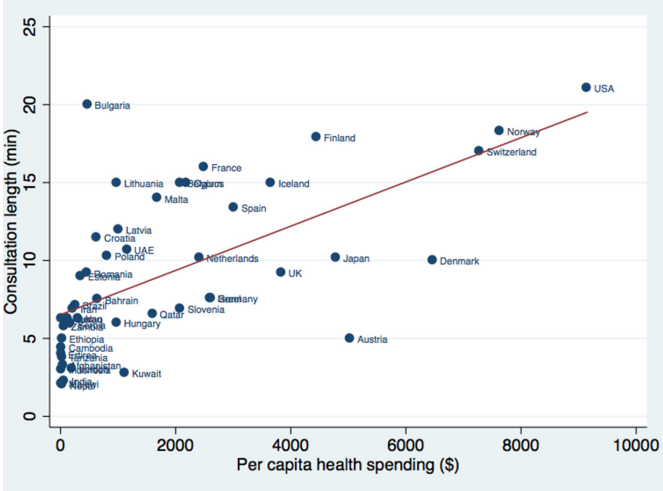

Figure 4 Consultation length versus per capita health spending ($).

A lack of time in the consultation is a key constraint to delivering expert generalist care.[35] The finding of the association between shorter consultations and physician burnout due to a lack of personal accomplishment may indicate that doctors feel less productive and competent at managing complex multimorbid patients in those settings with short consultation lengths. Addressing this limitation is necessary if patients with complex needs and multimorbidity are to be effectively managed within primary care.[36]

There were considerable differences in the trends of consultation length over time between the USA, Australia and the UK. In USA the average consultation length has increased steadily to over 20 min—this despite the countries having a relatively stable proportion of primary care physicians per 1000 population. Consultation length in the UK has also increased steadily over time, although the methods used in the included studies were heterogeneous. Changes here predate the introduction of the quality standard of 10 min for routine booked appointments and reflect the low starting point of consultation length and a steady increase in the density of primary care physicians over time.[37] It is also interesting to note that at the current rate of change, the consultation length in the UK would only reach 15 min in 2086. Consultation length in Australia was stable at just under 15 min, reflecting the popular book length of 15 min, which avoids the increased charge for 20 min appointments.

The countries with the greatest health needs would be expected to have the greatest need for longer consultations, but their consultation lengths were generally low. The association between average consultation length and per capita healthcare spending supports the claims that shorter consultation length is a good measure of poverty, even in the industrialised world. While this association does not necessarily imply causation, it does suggests that the inverse care law may be an international phenomena. It was concerning that in some low-income/middle-income countries, average consultation length appeared to be shortening, suggesting that progress is not inevitable,

Figure 3 Consultation length over time in Australia, the USA and the UK.

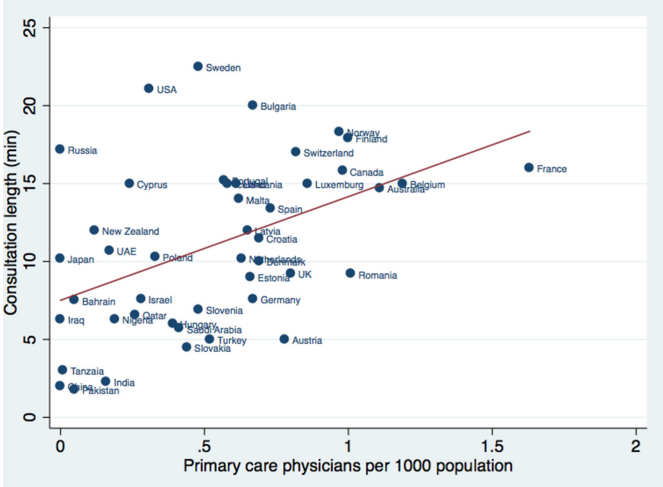

Figure 5 Average consultation length versus primary care physician density per 1000 population.

and if resources are not put into primary care then expanding populations and rising treatment possibilities could overwhelm us.

The absence of a statistically significant relationship between consultation length and consultation rate per patient per year suggests that if the consultation length increases, it does not necessarily follow that the number of visits per year will decrease. The number of consultations per patient per year can vary widely from country to country, and the total time a patient spends with their primary care physician is also likely to vary widely.[38] For example, in 2008 it was estimated that the mean number of consultations with a GP in the UK was 3.23 per year, and the average consultation length was 11.7 min so the total time spent with any GP per year was estimated to be 37.8 min per patient. In 1997 the total time was 27.8 min, a 10 min increase in 11 years.[38]

Large variations in the number of primary care physicians per capita are known to exist between countries.[24] The review found a statistically significant association between average consultation length and the number of primary care physicians per capita. This remained significant after adjusting for per capita healthcare spending. The USA appeared to be an outlier in this relationship, achieving a relatively long consultation length with only a modest primary care physician density—this may be due to the ready availability of specialists in this country.

The association between consultation length and the burnout of primary physicians supports findings from national studies.[4] Specifically, the association items relating to efficiency support reports thatincreasing workload may be a key contributing factor to burnout. .[26] There was an association identified between longer consultation length and reduced hospital admission for diabetes. This reflects findings elsewhere that strong primary care can reduce admissions for ambulatory sensitive conditions.[5] The lack of association between consultation length and the requesting of scans support findings from other studies that long consultations do not necessarily result in more test requests.[12] There was no association between A+E admission rates; however, these data were not adjusted for ambulatory sensitive conditions.

Quality of the evidence

The quality of studies was graded 'good' in less than half of the included studies. Of the included studies 43% were identified in the grey literature and not published in peer-reviewed journals. Fifty studies had links to the WHO/INRUD, which includes average consultation length as a quality indicator for rational prescribing. Many studies failed to provide a definition of consultation length, leading to uncertainty as to what was actually measured. Despite evidence to show that awareness of video recording does not alter consultation length, relatively few studies followed this approach.[18] The use of other techniques such as self-timing, observer timing with a stopwatch or by sending an SMS message is likely to be influenced by various forms of reactivity, changing one's behaviour when it is known one is being observed.

Although the response rate was satisfactory in some surveys, others had a high proportion of missing values for consultation length items. For example the NAMCS survey had ~26% missing. Samples were often non-random or quasi-randomised and clustering effects were likely. Several studies had a sample size of less than 30 and as a result are likely to be unreliable. Self-reporting is likely to result in reporting bias. Inspection of data sets indicated that reporting in surveys tended to round to the nearest 5 min (or an even number). Calculating consultation length by dividing the total session by the number of patients seen is likely to lead to overestimation.[16]

Populations were poorly described in many studies. Gender of the consulting doctor, age of the doctor, country of graduation, qualification, location of practice (rural or urban), socioeconomic status, services provided, and proportion of chronic disease management, proportions of children, number of largely administrative consultations for example, and consultations principally used to issue repeat prescriptions are all known to influence consultation length, yet were seldom reported. Key summary statistics such as mean, median, mode, SD and 95% CIs were inconsistently reported in the many of the poorer quality studies.

Strengths and weaknesses

This is the largest international review of consultation length to date. The search used English-language studies, and Chinese, Japanese, Spanish, Portuguese and Russian databases. Several of the identified studies were found in the grey literature from the survey of WONCA representatives. It is important to highlight that the findings presented here are intended to be illustrative. No weights were added to sample data to produce national estimates or to accurately assess the sampling error for consultation length. Given that many of the analyses use average consultation length rather than original data, the variance will be suppressed. As with many comparisons of international data, the associations comparing consultation length with outcome data contained a relatively small number of data points and are likely to be underpowered, running the risk of a type I error.[39] Differences between rural and urban, and public and private practices, were not taken into account, which could explain some of the variations identified.

Implications for research

The Australian BEACH (Bettering the Evaluation and Care of Health) system is an excellent example of a consistently high-quality reporting of key summary statistics, including a large sample size, and a standardised method for collecting data that enabled annual comparisons.[40] Unfortunately the Canadian physician survey missed opportunities to collect consultation length data, along with the UK where reporting has been infrequent and inconsistently measured. The American NAMCS

was another good example of an open approach to sharing anonymised data on consultation length.[41] It was concerning that data were only available for the remaining countries where the remaining 24% of the world population live. It is vital that organisations such as the OECD, WHO and WONCA encourage measurement of consultation length and rates in countries that currently have no data. At present this is reported by the WHO/World Bank only in relation to all doctors. These data should be disaggregated further to evaluate primary care physicians. Novel approaches to measuring consultation length, for example, SMS, hold promise, but the accuracy of such approaches needs to be validated against the reference standard of video consultations and evaluated to see if awareness of their use influences physicians' consultation length.

Implications for policy

Policy makers can compare their country with others to consider both what a desirable and mean consultation length should be, and also how administrative requirements can greatly influence how scarce time is spent when patients consult physicians. The very short consultation length in some countries contrasts markedly with the effort and expense used in reaching the facility. Instead of simply calling for longer consultation lengths, the focus should be on precisely *how* longer consultations can be achieved considering systems that have achieved this goal. Increasing the number of primary care physicians is likely to help the situation in many countries.

Average time is an established measure of quality and used by the WHO and the INRUD as a measure to promote the safe and cost-effective use of drugs—it should be universally and regularly reported and over time be accepted as an essential measure on the quality of health services around the world. Those countries with sufficient resources should consider adopting an approach similar to the Australian BEACH studies, which in our view represents the gold standard for consistent reporting.

CONCLUSION

There are international variations in consultation length, and it is concerning that a large proportion of the global population have only a few minutes with their primary care physicians. Such a short consultation length is likely to adversely affect patient healthcare and physician workload and stress.

Acknowledgements We would like to thank Kathy Holloway of the WHO for providing data from the INRUD database. We would also like to thank WONCA members for helping with the grey literature search. Special thanks also goes to Luisa Pettigrew (WONCA Executive and WHO liaison), Ryuki Kassai (Fukushima University), Faisal Al Nasir (Arabian Gulf University) and Shlomo Vinker (Tel Aviv University). We would also like to thank Jean Soler and the members of the European Burnout Study for sharing their data, and Michael van den Berg for sharing data on emergency department use.

Contributors GI designed the review, extracted data, wrote the protocol, conducted the analysis, and drafted and revised the paper. ALN extracted data, and drafted and revised the paper. HD-M revised the paper. AO extracted data. HT extracted data. AV extracted data. JH designed the review, and drafted and revised the paper. GI is guarantor.

Funding GI is an NIHR Clinical Lecturer and HDM is an NIHR Doctoral Research Fellow who are funded by the National Institute for Health Research (NIHR). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR, or the Department of Health. However, this research received no specific grant from any funding agency in the public,commercial, or not-for-profit sectors.

Competing interests None declared.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement No additional data are available.

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