Global Pharmacy Workforce Intelligence: Trends Report

2015

Fédération Internationale Pharmaceutique

International Pharmaceutical Federation

International Pharmaceutical Federation

FIP *Ed*ucation Initiative

Preparing the pharmacy workforce of the future:
better science, better practice, better health care.

Colophon

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Foreword

Human resources for health are at a critical low. The World Health Organization estimates that the current shortage of health workers is in excess of 7.2 million worldwide and that, by 2035, the shortage will reach 12.9 million. Pharmacists, in particular, are lacking in the workforce in many countries. In addition, education and training needs to be strengthened globally.

Pharmacy needs a global vision that encompasses the sharing of experiences, gathering of evidence and collaborative guidance to facilitate country-level initiatives.

FIP*Ed* is the name given to the component group of the International Pharmaceutical Federation (FIP) that is bringing together all of the federation's efforts in transforming and strengthening professional pharmacy and pharmaceutical sciences education globally. It is organised as a cross-cutting initiative that includes both of the boards of FIP as well as its governance bodies. More than 100 practitioner and scientific educators and over 130 deans of schools of pharmacy from throughout the world are involved in congress programming on educational issues.

The FIP*Ed* team prepares technical and policy papers on key areas of education, contributes to an online international journal on pharmacy education, gathers leaders in education to establish a future agenda for transformation of pharmaceutical education, and links educational policy issues to national needs for workforce development, capacity building and quality assurance.

All of these initiatives are closely tied to enhancing appropriate medicines use in global health systems, with a strong emphasis on competency development across the continuum of the pharmaceutical workforce for practice and science.

Workforce intelligence is one of the foundations for professional development in both pharmacy practice and pharmaceutical sciences, and the strengthening of workforce development in the global community of universities and training centres are integral parts of FIP's Vision 2020. This report links to two other FIP reports published in 2015: 'Advanced Practice and Specialisation in Pharmacy' and 'Interprofessional Education'. FIP stakeholders have identified these topics as being globally important and valuable for professional leadership bodies worldwide. The strengthening and expansion of pharmacists' roles and scopes of practice to assure responsible use of medicines is strongly reliant on a capable workforce that is socially accountable and trained to meet international standards for quality. In that vein, FIP*Ed* works in close collaboration with the World Health Organization (WHO) and the United Nations Agency for Education and Social Development (UNESCO), as well as with many leading universities and national organisations.

This FIP*Ed* Global Report on Workforce Trends is the first publication of its kind to provide a baseline on the current growing global trend, regarding capacity building and pharmacist numbers. We share this knowledge from our members to our members and beyond to trigger dialogue and action that will result in stronger evidence-based policies. We hope that this will stimulate collaborations/partnerships between all stakeholders, and will include professional organisations and universities taking up the important role of advocating transformation of professional development education at the national level.

This report, and others like them, are only possible due to the commitment and expertise provided by the principal authors and the personnel who have contributed to case studies and the provision of evidence and data. This report represents a significant commitment of time and effort, and on behalf of the FIP*Ed*, I am sincerely grateful to the individuals, organisations and institutions who have made these significant contributions. Without their contribution and commitment, these influential and data-rich publications would not be possible.

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PART 1

KEY MESSAGES

The aspiration of many countries towards establishing universal health coverage will require an enhanced health workforce, including pharmacists that can meet the need for pharmaceutical expertise in the population it serves. It is important to monitor trends in the workforce over time.

The countries identified as having data for each of the time points 2006, 2009 and 2012 were present in all WHO regions, with Europe having the most countries with data available and South East Asia the fewest.

All WHO regions have experienced an increase in the density of pharmacists (measured as number of pharmacists per 10,000 population) over the period 2006–12. However, some countries indicate a reduction in the density of pharmacists.

African countries show large relative increases in acceleration of capacity building, but remain significantly behind in terms of absolute capacity *per capita*.

South East Asian and Middle Eastern countries also show large proportional changes in pharmacist workforce.

The global trend is an increase in workforce across all nations and regions, and this is a move in the right direction towards improved access to, and availability of, pharmaceutical expertise. However, there is still much to be done, with some regions and low-income countries still displaying a disproportionately low number of pharmacists on small overall capacity for delivering pharmacy services.

PART 2

INTRODUCTION AND CRITICAL APPRAISAL OF NEW HUMAN RESOURCES FOR HEALTH (HRH) EVIDENCE SINCE 2012

FIP's Global Pharmacy Workforce Surveys conducted in 2006, 2009 and 2012 analysed, monitored and reported on the status of the pharmacy workforce at country level. In 2012, the survey collected workforce data for 90 countries and territories representing 2.5 million pharmacists and nearly one and a half million technicians and support workers. Fifty-one countries responded to the 2009 report and 34 to the 2006 survey.

A key message from the 2006, 2009 and 2012 Global Pharmacy Workforce Reports was that pharmacy workforce density varied considerably between countries and WHO regions and generally correlated with population numbers and country level economic development indicators. Those countries and territories with lower economic indicators tended to have relatively fewer pharmacists and pharmacy technicians.

Access to high quality health services is vital for the delivery of a nation's positive health outcomes. For example, the reduction of morbidity associated with long-term conditions requires access to pharmacy teams who can provide medicines and advice. Ensuring the availability of an appropriately skilled pharmacy workforce within services and facilities with effective distribution across a nation is an important approach for improving equitable access. Each country in this report started from a different baseline in terms of the number of pharmacists. The impact of changes in the density of the pharmacy workforce (whether this is an increase or decrease) on health outcomes is difficult to judge. Additionally, changing epidemiology and disease burden at a country level as well as population increases need to be considered and an assessment made as to whether the development of pharmacy human resources has adapted and made an impact over time.

The proportion of women in the pharmacy workforce continues to increase resulting in more part-time working and therefore a greater headcount being required to meet demand. Productivity of pharmacists in many locations is being increased due to technology (use of robotics) and optimising skill mix (expansion of the pharmacy technician role). Conversely demand for pharmacists is also increasing in some areas because of the creation of new roles in order to mitigate shortages in other healthcare professions such as medicine and nursing.

The aspiration of many countries towards establishing universal health coverage will require a health workforce, including pharmacists, that can meet the needs for pharmaceutical expertise of the population it serves. The WHO has set three density thresholds for skilled healthcare workers — 22.8, 34.5 and 59.4 per 10,000 population — to highlight the variation in workforce availability in 2013. These thresholds are not described as benchmarks (for example, for countries to measure each other's workforce against) but are suggested to form the basis of discussion on what the workforce requirement should be in order to improve health outcomes. It is regrettable, however, that no threshold has yet been defined for pharmacists.

However, there is no universal coverage of workforce intelligence — human resource information systems are still weak in many countries and the number of countries publishing regular and consistent official workforce data is low. Changes in the number of skilled health professionals indicate that most countries are attempting to increase workforce availability, and using density of skilled healthcare workers is a proxy measure of this. However, density may decrease because population growth is higher than the growth of the workforce or because of emigration of workforce.

It is therefore important to assess trends in the pharmacist workforce against countries' populations, disease burden and economic situation. This report seeks to address some of these issues for the pharmacist workforce.

A bibliography can be found in annex 3.

PART 3

TRENDS ANALYSIS

This section presents the data and analysis of the trends in the pharmacy workforce covering the time span of 2006, 2009 and 2012. Trends will be identified (for data that were collated in 2006, 2009 and 2012) and comparisons made. The corresponding country population data for these years was extracted from the World Bank database, which uses a consistent methodology for capturing demographic and economic data. Pharmacy workforce data capture has previously been described in the FIP*Ed* reports for the corresponding years (available from http://www.fip.org/educationreports).

The methodology proceeded with the following steps:

1. Access FIP workforce data collated in 2006, 2009 and 2012. The data focused (due to limitations from 2006 databank) on pharmacist workforce capacity;
2. Identify country level data available across at least two of the three time points (2006, 2009 and 2012);
3. For countries where there is a gap in one data point, undertake a literature and data search to capture the missing data;
4. Plot data over the three time points to identify trends.

Quality assurance was based on previous reporting and identification of data outliers for cross-checking. The accuracy of the dataset was checked with previous respondents when possible and independent checking was conducted before being prepared for analysis.

Countries identified for the trends analysis are shown in table 1 by WHO region.

Table 1: Countries identified for the trends analysis by WHO region.

WHO Region	Countries	Countries 3-digit codes
Africa	Ethiopia	ETH
	Ghana	GHA
	Kenya	KEN
	Mali	MLI
	Nigeria	NGA
	Tanzania	TZA
	Uganda	UGA
	Zimbabwe	ZWE
Eastern Mediterranean	Egypt	EGY
	Israel	ISR
	Jordan	JOR
	Pakistan	PAK
	Sudan	SUD
Europe	Austria	AUT
	Belgium	BEL
	Croatia	HRV
	Czech Republic	CZE
	Finland	FIN
	France	FRA
	Germany	DEU
	Hungary	HUN
	Iceland	ISL
	Ireland	IRL

Table 1: Countries identified for the trends analysis by WHO region (cont.).

WHO Region	Countries	Countries 3-digit codes
Europe	Italy	ITA
	Macedonia, Rep	MKD
	Malta	MLT
	Norway	NOR
	Portugal	PRT
	Spain	ESP
	Switzerland	CHE
	Turkey	TUR
	UK	GBR
Pan-America	Argentina	ARG
	Brazil	BRA
	Canada	CAN
	Costa Rica	CRI
	Mexico	MEX
	Uruguay	URY
	USA	USA
South East Asia	Cambodia	CAM
	India	IND
	Indonesia	IDN
	Nepal	NPL
	Thailand	THA
Western Pacific	Australia	AUS
	Japan	JPN
	Republic of Korea	KOR
	Singapore	TWN
	Taiwan, China	SGP
	Vietnam	VNM

Matching data across the three time points (2006, 2009, 2012) and charting pharmacist capacity across these dates provides an overview as seen in figure 1 (capacity is measured as "density": the number pharmacists per 10,000 population and serves as a standardised measure for the purposes of this report). Table 2 describes the mean percentage change in pharmacist density for each WHO region in this sample.

Table 2: Mean percentage change in pharmacist density per 10,000 population by WHO region 2006–12.

WHO Region	Mean % change in pharmacist density 2006–12
Africa	+14.8%
Eastern Mediterranean	+38.5%
Europe	+24.2%
Pan-America	+14.3%
South East Asia	+24.1%
Western Pacific	+43.1%

Figure 1: Changes in mean density 2006–12 (n=51).

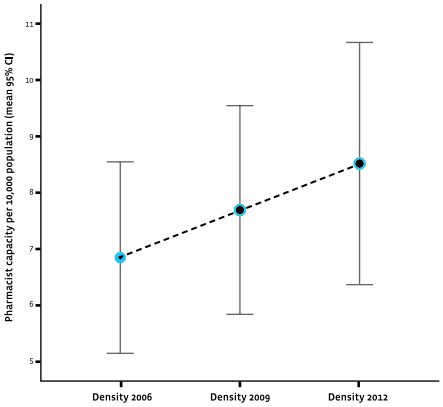
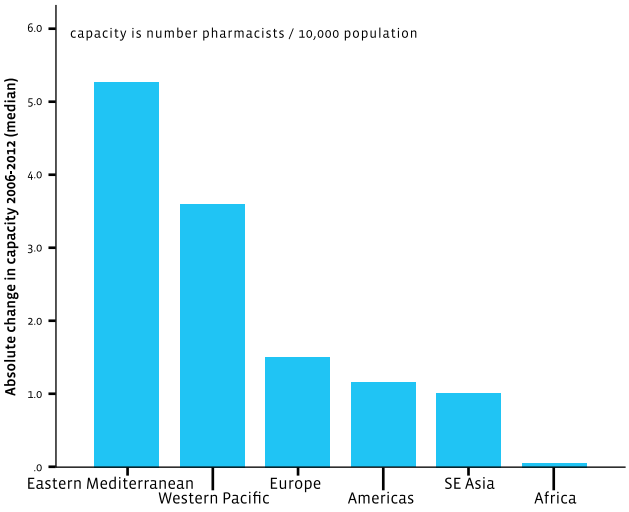


Figure 1 and table 2 show proportional changes in pharmacist capacity over the three-time points. Figure 1 displays this as absolute changes, in other words as the absolute pharmacist density *per capita*, while table 2 shows this as relative per cent changes; it is important to remember, and this will be emphasised during the course of this report, that percentage changes and absolute changes may tell different stories.

A small change in the absolute pharmacist density in a country with very low capacity to begin with can result in a large percentage increase; conversely a small percentage increase in a country with high-density will result in a large absolute figure for workforce headcount. Within the WHO regions there are also significantly wide variances that can make interpretation of aggregate statistics difficult. However it is clear from figure 1 that the global trend for pharmacist workforce is increasing, and based on these data presented here we estimate this increase to have been around 16% over the period concerned.

Figure 2 shows these median increases in density split by WHO region and presented as cumulative proportional changes over the period 2006–12.

Figure 2: Proportional change in absolute capacity by WHO region.



Again, converting changes to relative proportional changes may mask small absolute trends, particularly in smaller nations or nations with low capacity to begin with. Figure 2 does serve to indicate differing rates of increase (rate of change) across WHO regions in absolute terms, with Africa having the smallest absolute changes in capacity.

Annex I describes in detail how populations, World Bank Classification and pharmacist density has changed over the time points 2006, 2009 and 2012.

Global picture

Charting the change in workforce density over the period 2006–12 provides a meaningful picture of workforce capacity trends. The full sample (n=51 countries) is shown in figure 3a; countries and territories are identified by the ISO three-letter abbreviation (see appendix 2 for alphabetic order) to maintain clarity. The cluster of countries at the bottom of figure 3a are those that have very low pharmacist densities, and due to scaling of the vertical axis cannot easily be identified on this chart; figure 3b shows this cluster in expanded scale detail for comparison.

Figure 3a: Time trend for full data sample 2006–12.

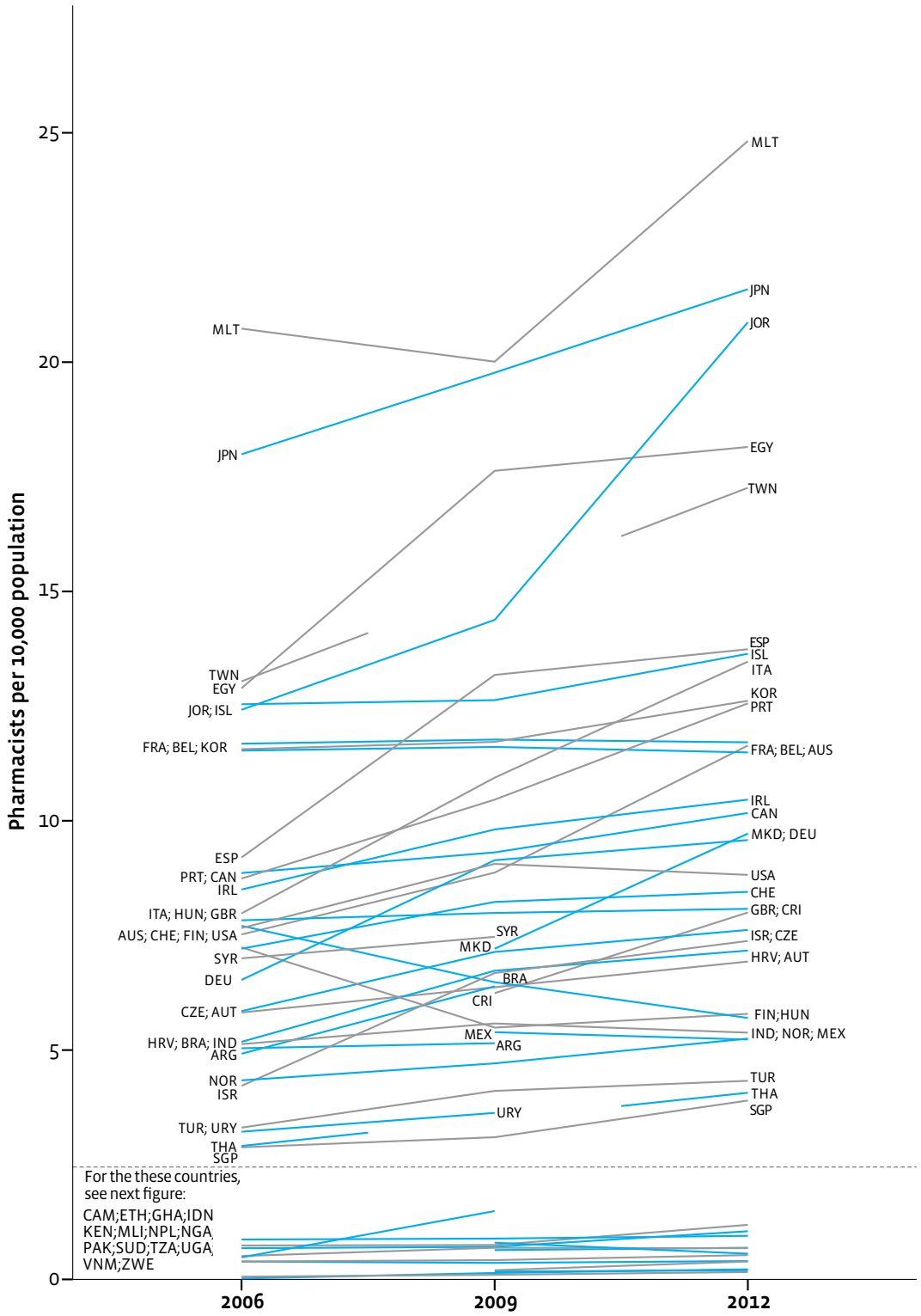


Figure 3b: Time trend for low capacity data cases (sub-set Fig 3a).

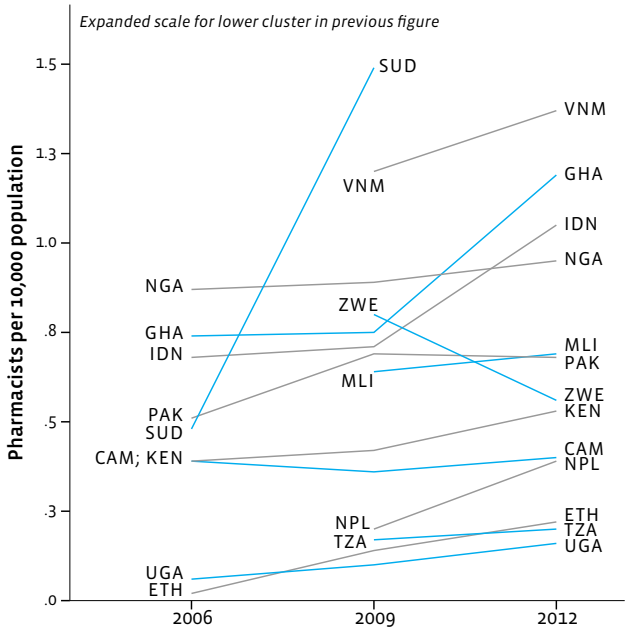
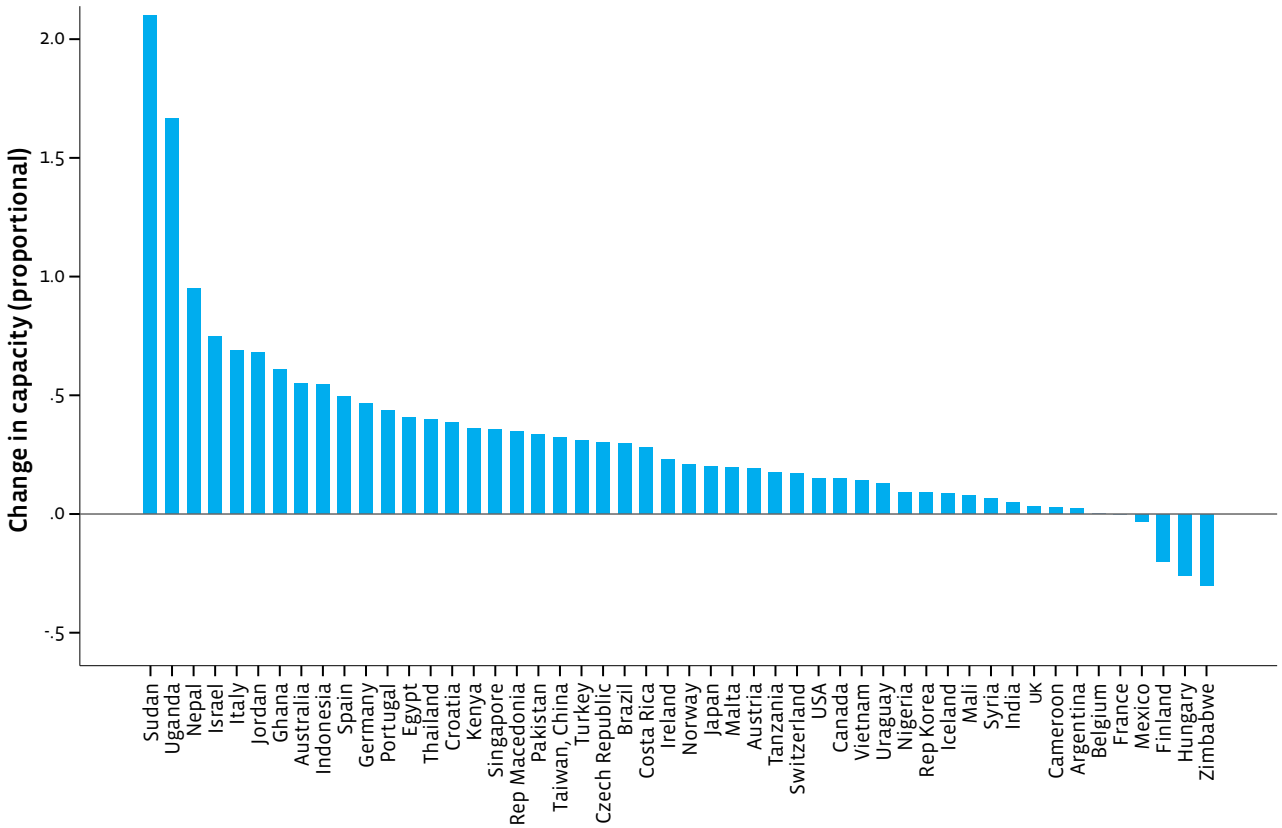


Figure 4: Relative capacity change as a Z-score.



A summative chart to show relative changes in capacity is provided in figure 4 (using a Z-score, or standard deviation unit for scaling purposes), and shows more clearly that, with the data provided, not all countries have been increasing capacity, although changes in overall population denominators may contribute to the negative increases.

It also shows that some countries with small initial capacity (for example Sudan, Uganda) have proportionally increased capacity, relatively, to a significant extent, although once again their absolute capacity density remains very low in comparison with other, more high-income countries.

Figure 5 through to figure 10 shows the trends in workforce from 2006–12 for the sample split by WHO region.

Figure 5: Time trend for Africa region data cases 2006–12.

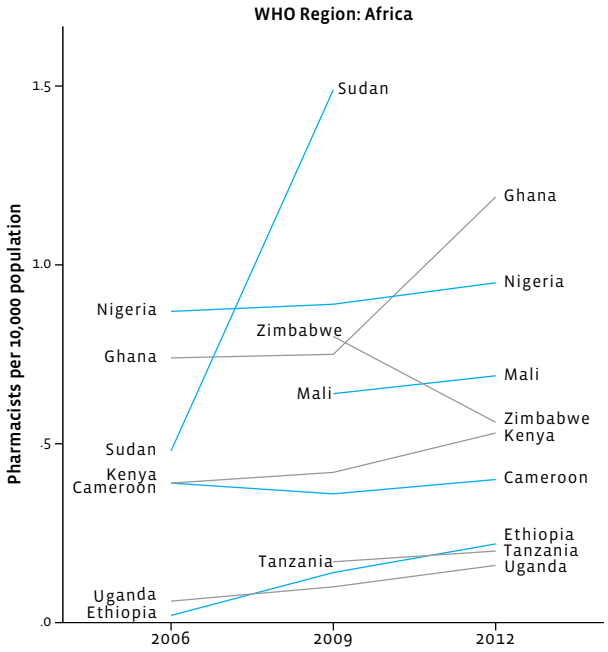


Figure 6: Time trend for the region of the Americas data cases 2006–12.

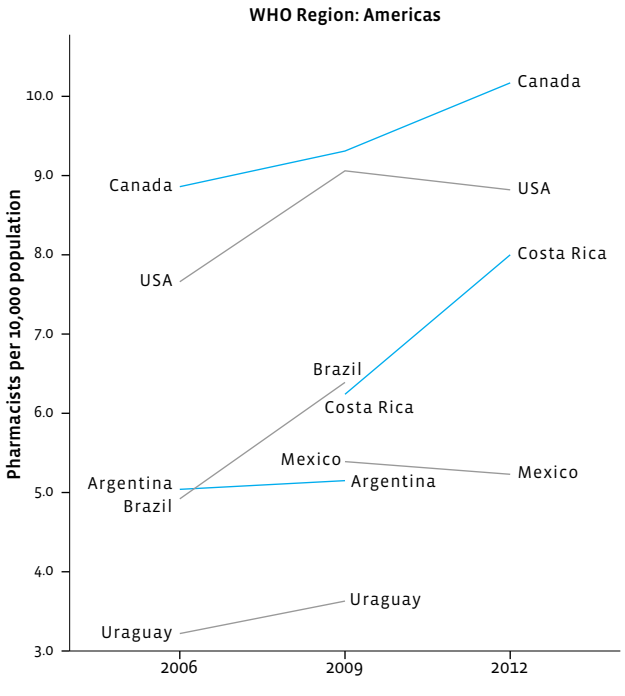


Figure 7: Time trend for Eastern Mediterranean region data cases 2006–12.

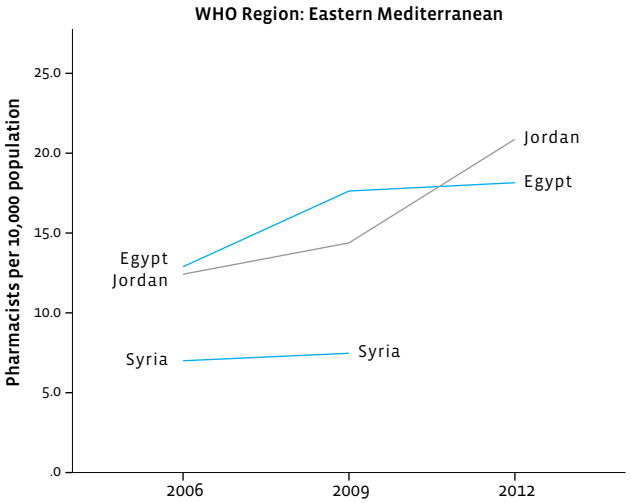


Figure 8: Time trend for Europe region data cases 2006–12.

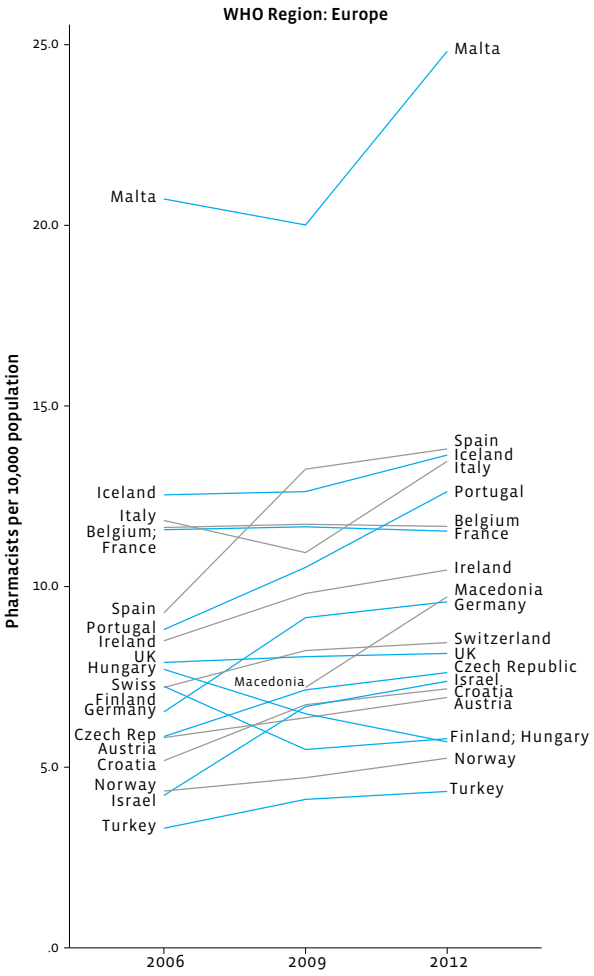


Figure 9: Time trend for Africa region data cases 2006–12.

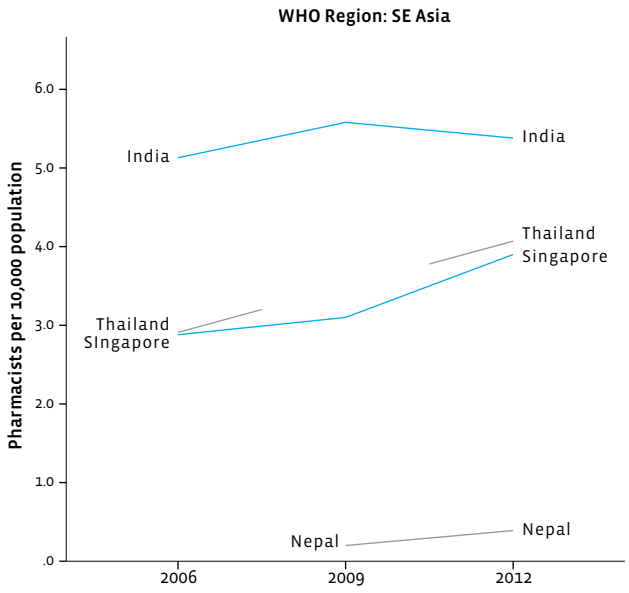
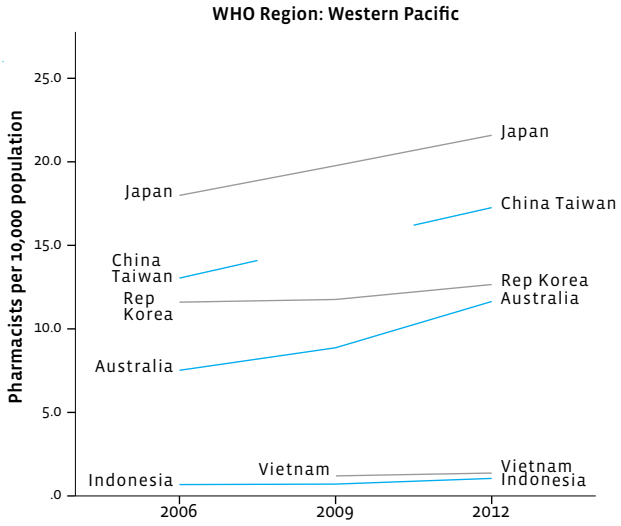


Figure 10: Time trend for SE Asia region data cases 2006–12.



The workforce density data was also examined by country-level income classification (World Bank) and presented as figures 11 and 12 for individual countries in the sample. Figure 13 shows the aggregated capacity change (as absolute density) across the time period using World Bank income level classification.

Figure 11: Time trend for low & lower middle income data cases 2006–12.

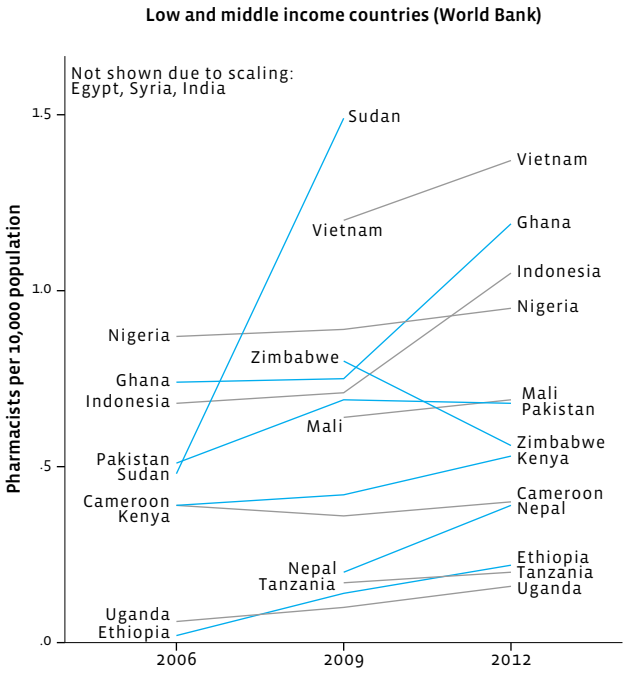


Figure 12: Time trend for high & upper middle income data cases 2006–12.

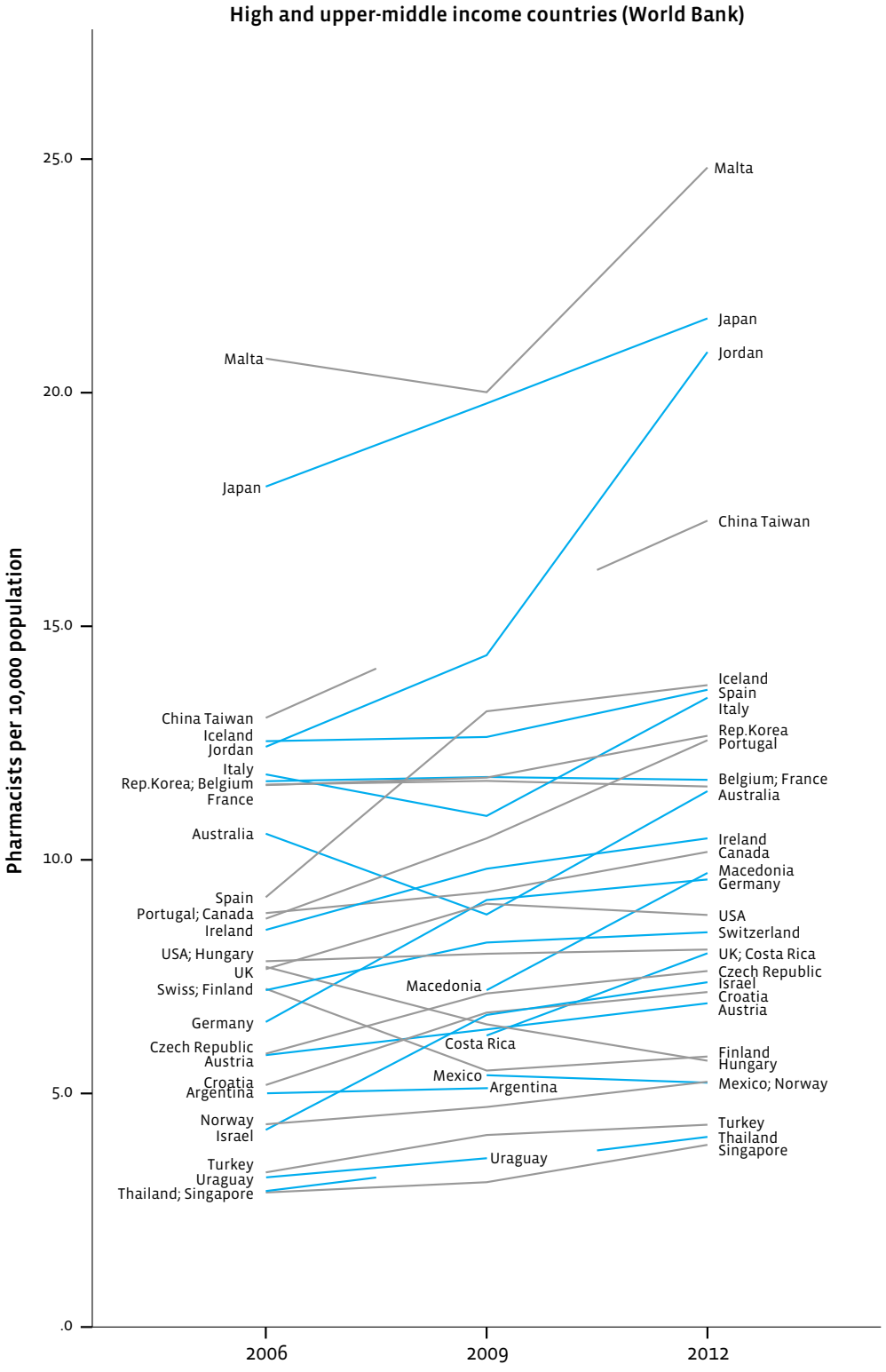


Figure 13: Capacity change (density) for World Bank classified countries.

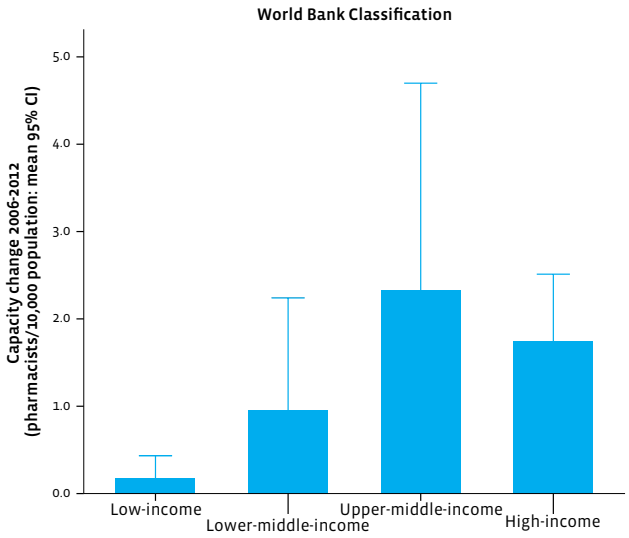


Figure 14: Dual plot of relative and absolute change to capacity 2006–12 (Z scores).

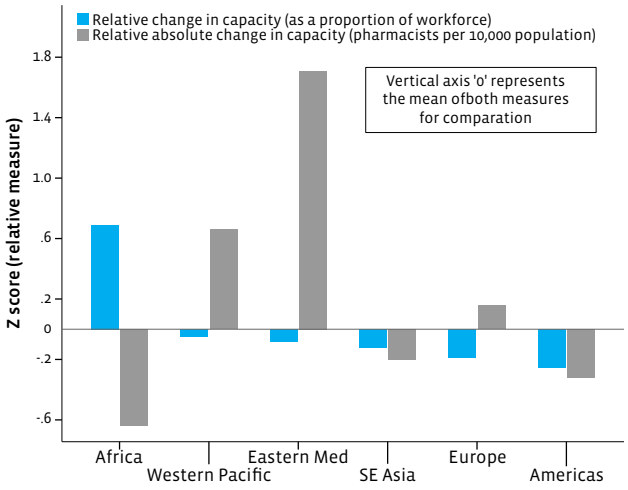


Figure 13 shows that capacity change is more prevalent in higher-income countries and is associated with economic factors. Although some African nations, for example, have made significant relative increases in capacity development (Uganda and Sudan have increased their own capacity by high percentages) in relation to other countries, Africa remains capacity-poor overall.

Presenting data on workforce is always problematic, as has been alluded to earlier in this report. Presenting proportional change (which is easy to visualize) or absolute change (harder to interpret but more realistic) is challenging. Figure 14 illustrates this, as an attempt to present both relative and absolute aggregated workforce data. Change in relative capacity and change in absolute capacity are shown as converted Z-scores for the sample data; negative values on the vertical axis do not indicate a negative effect, or numbers below zero, but are an indication of a value less than the sample mean.

Hence, we can see that African region countries (aggregated) have higher than average relative change, but below average absolute change. These countries collectively are increasing capacity, proportionally, very quickly, but remain well below average for actual density, expressed as pharmacist per 10,000 population. In other words, the acceleration of pharmacist production is ongoing, but it remains well below the global average for actual numbers. Again, some of these aggregated statistics have outliers incorporated into them, making for a wide variance within groupings.

PART 4

PHARMACY WORKFORCE INTELLIGENCE SYNOPSIS

The countries identified as having data for each of the time points 2006, 2009 and 2012 were present in all the WHO regions, with Europe having the most countries with data available and South East Asia the fewest. All WHO regions have experienced an increase in the density of pharmacists per 10,000 population over the period 2006–12. Some decreases observed in density of pharmacists may be a result of net migration to other countries or other factors such as changes in national health policy.

Mapping pharmacists *per capita* with the World Bank classification gives an indication of the relationship of the workforce with economic indicators. Global Pharmacy Workforce Reports have shown a linear association with total pharmacist numbers and World Bank classification. In other words, the higher the level of a country's income the greater the number of pharmacists. Figure 13 illustrates that the capacity change over the period 2006–12 (i.e. the change in the mean number of pharmacists per 10,000 population) showed the largest increase for the upper-middle income countries compared with all other country income groups. This may reflect a greater increase in the growth in the economies classified as upper-middle income compared with other country income groups.

Funding of the pharmacy workforce will also have an effect on its national workforce density. Adequate funding is required for workforce expansion, sometimes through financial incentives such as higher wages for pharmacists where there is a shortage — though this is of course dependent on the strength of a country's economy. The World Bank Classifications (WBC) have generally remained static over the period analysed, except for Croatia, Ghana, Hungary, India, Jordan, Nigeria and Pakistan, all of which increased their incomes over the period 2006–09. An increase in income did not necessarily result in an increase in the density of pharmacists, with only Croatia, Ghana Jordan and Nigeria achieving a greater density. Pakistan experienced an initial increase in its pharmacist workforce but this was followed by a small decrease.

The WBC may not be a sensitive enough measure since it will not necessarily identify economic downturns and recession (leading to budget cuts and service reductions in the healthcare sector often resulting in redundancies and freezes on recruitment of staff) in individual countries. It is important to consider that the lead time for training a pharmacist is five years on average, so increases in the training of the number of pharmacists will take at least five years to be translated into a workforce increase.

Although the density of pharmacists has increased substantially in many lower-income countries such as Ethiopia, their baseline still remains low compared with those of higher income countries. For both lower-income countries and higher-income countries overall workforce numbers should be determined by strategic goals set by health policy-makers considering demand for health services. However, in reality reaching these goals may be challenging because of variations in the production of the workforce (e.g. numbers of schools of pharmacy and the lag time between educating and deploying staff) leaving lower-income countries with chronically low numbers in comparison with higher-income countries.

Other influences that contribute to the dynamics of the workforce are the flows of pharmacists into and out of countries (immigration and emigration), part-time/interrupted practice and the proportion of workers reaching retirement age — all of these impact on the number of pharmacists available to nations. Achieving a higher density of pharmacists also depends, in part, on the capacity of strategic workforce planners in Ministries of Health and structural issues such as recruitment and distribution of workers (including direct investment in the production of the workforce).

When considering changes in the density of pharmacists per country over time it is useful to consider what the effect is on pharmacy workforce balance. When there is a national 'gap' between supply and demand for the pharmacy workforce then imbalances occur. Variations in pharmacist density should not necessarily be considered a workforce imbalance. Changes may also reflect differences in role as pharmacists may be contributing to a nation's healthcare in non-patient facing roles in the pharmaceutical industry and pharmaceutical manufacturing units.

Additionally, density of pharmacists does not describe the productivity or distribution (and therefore accessibility, as generally healthcare workers tend to be more concentrated in urban rather than rural areas) of the workforce. For instance, as health demand increases the healthcare workforce needs to shift either by increasing its supply or by increases in its productivity. Absolute numbers of pharmacists do not reflect the issue of part-time workers, especially if their proportion has a greater increase relative to the growth in the number of pharmacists. Failure to respond to increased health demand results in workforce imbalances and risks non-achievement of positive health outcomes.

Another factor may have an effect on changes in pharmacist density. For some nations, changes may result from migration of the workforce to other countries. Some countries actively train health workers and export them (evidence of this needs to be established for the pharmacy workforce). There may also be unplanned migration of health workers and this is evidenced by the percentage of pharmacists employed in countries in which they did not qualify (this information is often available from a nation's register of pharmacists). Changes to the following will also impact on a nation's density of pharmacists:

- Education and training processes;
- Healthcare policy and systems;
- Human-resources for health policy and processes;
- Sociocultural environment.

It is also possible that changes in pharmacist density relate to a country's response to changes in disease burden. The Disability-Adjusted Life Year (DALY) is a common method of assessing the disease burden of a region or country. It measures the number of years of life lost due to premature mortality and years of life lost due to time lived in states of less than full health. The WHO does not use this measure as frequently as recent Global Pharmacy Workforce Surveys; however, the WHO did plot change in the top 10 DALYS between 1990 and 2010 for each country as published in the 'Universal Truth' report of 2014.

In future, for the purposes of the FIP*Ed* workforce trends report, density of pharmacist workforce will be modelled against total DALYs for a country as a way of assessing the impact of the pharmacy workforce on the disease burden. The challenge will be finding evidence of the total DALYs for all countries over a period of time.

A bibliography can be found in annex 3.

PART 5

SUMMARY AND CONCLUSIONS

Although many WHO regions have experienced increases in their pharmacist workforce (notably the Eastern Mediterranean and Africa) over the period 2006–12, countries that are classified by the World Bank as low or lower middle income still have a very low density of pharmacists compared with those nations classified as high or upper middle income.

It has been well documented that for low income countries in particular there is a shortage of healthcare professionals needed to deal with the local disease burden. Such countries' increases in workforce (where they can be achieved) might not be keeping pace with the increases in population and shifts in disease burden.

It is essential to monitor the global pharmacist workforce trends at regular time points so that decisions can be made as to how countries can deploy their workforce. There is also an increasing international transfer of healthcare professionals.

The WHO is rightly pushing for health equity as a global human right and having access to a pharmacist is key to that since medicines represent one of the most important interventions in health.

Annex 1. Data Table

Country	WBC*	Data 2006		Data 2009		Data 2012	
		Population	Pharmacist density**	Population	Pharmacist density**	Population	Pharmacist density**
Argentina	3	38,747,000	5.04	39,746,000	5.15	40,728,738	no data
Australia	4	20,394,800	7.52	21,249,200	8.87	22,340,000	11.64
Austria	4	8,151,000	5.82	8,352,000	6.37	8,406,187	6.93
Belgium	4	10,480,000	11.60	10,695,000	11.69	11,047,744	11.63
Brazil	2	184,184,000	4.92	195,138,000	6.39	196,900,000	9.10
Cameroon	2	18,137,734	0.39	19,595,026	0.36	21,156,272	0.40
Canada	4	32,225,000	8.86	33,304,000	9.31	34,468,000	10.17
Costa Rica	3	4,320,130	no data	4,519,000	6.24	4,726,600	8.00
Croatia	4	4,442,000	5.18	4,433,000	6.73	4,280,622	7.17
Czech Republic	4	10,212,000	5.85	10,428,000	7.14	10,546,000	7.62
Egypt	2	71,777,678	12.89	75,491,922	17.63	82,637,400	18.15
Ethiopia	1	76,167,240	0.02	79,087,000	0.14	87,118,000	0.22
Finland	4	5,246,096	7.24	5,313,399	5.49	5,388,272	5.80
France	4	60,742,000	11.61	62,046,000	11.69	63,305,000	11.57
Germany	4	82,490,000	6.53	82,110,097	9.14	81,797,673	9.58
Ghana	2	22,019,000	0.74	23,947,000	0.75	24,965,800	1.19
Hungary	4	10,086,000	7.71	10,034,000	6.48	9,972,000	5.70
Iceland	4	295,000	12.54	319,000	12.63	318,900	13.64
India	2	1,103,596,000	5.24	1,149,285,000	5.71	1,241,275,000	5.29
Indonesia	2	221,932,000	0.68	239,945,000	0.71	243,801,639	1.05
Ireland	4	4,125,000	8.50	4,535,000	9.81	4,584,000	10.46
Israel	4	7,105,000	4.22	7,482,000	6.68	7,856,000	7.38
Italy	4	58,742,000	7.98	59,865,000	10.94	60,769,000	13.47
Japan	4	127,728,000	17.99	127,720,000	19.77	128,100,000	21.59
Jordan	3	5,411,000	12.42	5,849,000	14.38	6,632,000	20.87
Kenya	1	33,830,000	0.39	37,954,000	0.42	41,609,700	0.53

Annex 1. Data Table

Country	WBC*	Data 2006		Data 2009		Data 2012	
		Population	Pharmacist density**	Population	Pharmacist density**	Population	Pharmacist density**
Korea, Rep of	4	48,138,077	11.60	48,607,000	11.76	49,779,440	6.54
Mali	1	11,941,258.0	no data	12,716,000	0.64	15,394,000	0.69
Malta	4	403,834	20.73	409,379	20.01	416,268	24.82
Mexico	3	112,100,000	no data	107,677,000	5.39	114,793,300	5.23
Nepal	1	25,292,058	no data	26,997,000	0.20	30,486,000	0.39
Nigeria	1	143,300,000	0.87	148,071,000	0.89	162,265,000	0.95
Norway	4	4,620,000	4.34	4,661,000	4.71	4,952,000	5.25
Pakistan	2	157,971,415	0.51	172,800,000	0.69	176,940,000	0.68
Portugal	4	10,576,000	8.74	10,621,000	10.46	10,653,000	12.56
Macedonia, Rep of	3	2,090,044	no data	2,049,000	7.38	2,059,000	9.94
Singapore	4	4,296,000	2.88	4,790,000	3.10	5,167,000	3.90
Spain	4	44,710,000	9.20	46,501,000	13.18	46,742,697	13.74
Sudan	1	31,585,871	0.48	39,445,000	1.49	36,430,923	no data
Switzerland	4	7,446,000	7.21	7,633,000	8.23	7,868,000	8.45
Syria	2	18,167,367	7.00	19,933,000	7.47	21,961,676	no data
Taiwan China	3	22,731,000	13.04	22 770 383	no data	23,176,000	17.26
Tanzania	1	38,824,384	no data	40,213,000	0.17	46,218,500	0.20
Thailand	3	65,002,000	2.91	66,185,340	no data	69,519,000	4.07
Turkey	3	72,907,000	3.31	74,766,000	4.11	73,950,000	4.33
Uganda	1	28,724,869	0.06	29,194,000	0.10	34,543,300	0.16
United Kingdom	4	60,068,000	7.83	61,291,000	7.99	62,736,000	8.08
Uruguay	4	3,419,000	3.22	3,334,000	3.63	3,383,486	no data
USA	4	296,483,000	7.66	304,486,000	9.06	311,695,000	8.82
Vietnam	2	82,392,100	no data	85,122,300	1.20	87,840,000	1.37
Zimbabwe	1	12,710,589	no data	13,481,000	0.80	12,084,000	0.56

Notes:
* WBC – World Bank Classification. The World Bank classifies countries incomes as: high (4) upper middle (3); lower middle (2) and low (1).
** Density as pharmacists per 10,000 population.

Annex 2. ISO 3-Digit Table

Country	ISO 3-digit Country Code	Country	ISO 3-digit Country Code
Argentina	ARG	Korea, Rep.	KOR
Australia	AUS	Macedonia, Rep	MKD
Austria	AUT	Mali	MLI
Belgium	BEL	Malta	MLT
Brazil	BRA	Mexico	MEX
Cameroon	CMR	Nepal	NPL
Canada	CAN	Nigeria	NGA
Costa Rica	CRI	Norway	NOR
Croatia	HRV	Pakistan	PAK
Czech Republic	CZE	Portugal	PRT
Egypt, Arab Rep.	EGY	Singapore	SGP
Ethiopia	ETH	Spain	ESP
Finland	FIN	Sudan	SUD
France	FRA	Switzerland	CHE
Germany	DEU	Syria	SYR
Ghana	GHA	Taiwan, China	TWN
Hungary	HUN	Tanzania	TZA
Iceland	ISL	Thailand	THA
India	IND	Turkey	TUR
Indonesia	IDN	Uganda	UGA
Ireland	IRL	United Kingdom	GBR
Israel	ISR	United States	USA
Italy	ITA	Uruguay	URY
Japan	JPN	Vietnam	VNM
Jordan	JOR	Zimbabwe	ZWE
Kenya	KEN		

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