

Helpdesk Report: Primary health care v. Specialist services

Date: 14th March

Query: Determine the evidence on health outcomes, quality and cost for countries with strong primary health care (PHC) versus those countries with a specialist focus

Content

1. Overview
2. Data on workforce skills mix and health outcomes
3. Primary health care evidence: country-wide
4. Specialist service focus: country-wide evidence
5. Primary health care evidence: intervention-level
6. Evidence on generalist and specialist practitioners
7. Evidence on specialist services within primary care
8. Additional information

1. Overview

Since the World Health Organization's Alma Ata Declaration (1978) which affirmed the central role of primary health care (PHC) in improving health for all, it is perhaps unsurprising that the literature has a strong focus on primary health care. The donor focus in the last decade has been on primary health care which may explain why research on the impacts of specialist care has not been commissioned. Many policy reports and research papers argue for the importance of developing and strengthening primary health care in low and middle income countries and present evidence for PHC's positive impact on health outcomes, quality and cost.

Health workforce skills mix data were difficult to find. Data were available on a small selection of countries. Analysing skills mix and health outcome data does not show a clear relationship. There are many other factors contributing to health outcomes. The data presented is more usefully considered on a country by country basis.

Evidence presented from studies of primary health care systems in high income countries suggests that strong PHC is associated with a number of positive health outcomes including lower all-cause mortality; all-cause premature mortality; mortality from major respiratory and cardiovascular diseases; mortality associated with cancer and neonatal mortality (Macinko et al 2009, Atun 2004).

In low and middle income countries, there are a few studies that directly tested the hypothesis that health systems based on a strong PHC orientation lead to better health outcomes at a country-wide level. These identify positive outcomes. Other country-wide studies are suggestive of the role of PHC in population health improvements, but do not explicitly quantify or test the impact of specific PHC interventions (Macinko et al 2009, WHO 2008, Rohde 2008).

There are a number of studies which report improved health outcomes as a result of PHC at intervention and state level (Macinko et al 2009, DeMaeseneer et al 2007, Filmer et al 2000, Shi 1994). The bulk of evidence for PHC effectiveness in low and middle income countries is focused on infant and child health, although there is some evidence of a positive impact on maternal mortality, life expectancy, all cause mortality, and cause-specific mortality in adults (Macinko et al 2009). Studies are also presented which suggest that there is greater patient satisfaction with primary health care services (WHO 2008).

A limitation of the evidence regarding the impact of primary health care which is highlighted is that the definition of primary health care varies greatly between studies- from the presence of a Volunteer Health Worker in a community to the use of specific services to the development of an integrated network of health and social services in the community (Macinko et al 2009).

A few studies are reported which show no improvement in health outcomes attributable to PHC. Several of these suggest a need for higher quality primary health care services or a more comprehensive approach to primary health care (Macinko et al 2009, O'Donnell 2007).

It is argued that primary health care, when compared with specialist services, is lower cost as services delivered by specialists are more costly due to a tendency to use expensive technology and due to an orientation to curative rather than preventive medicine (Atun 2004, Filmer 2000). It is reported that health systems with a strong specialist focus, such as that of the United States, have higher total health care costs and have reduced access to health care by vulnerable populations. In low-income countries, evidence is reported that expenditure on PHC has a desirable distributive impact benefiting the poorer segment of the population proportionately more than the richer segment and increasing equity (Atun 2004, Starfield et al 2005).

No country-wide studies were found of health systems focused on specialist services which had a positive impact on health outcomes. In the literature identified, discussion of health systems with a focus on specialist services was largely negative. Although it was acknowledged that well functioning specialised tertiary care responds to a real demand, it was argued that the disproportionate focus on hospitals and sub-specialisation has become a major source of inefficiency and inequality which provides poor value for money (WHO 2008). It was reported that there is a consensus among public health specialists who focus on developing countries that the existing allocation of health expenditures toward curative care in secondary and tertiary facilities, such as hospitals and clinics to which patients are referred, is inappropriate and that a reorientation of government efforts toward primary health care would bring both health gains and cost savings (Filmer 2000).

Another approach is to examine the evidence regarding the impact of the comparative numbers of specialist or generalist practitioners on health outcomes, quality and cost. Several US studies found that states with more specialists spent more on healthcare but had no improvement in quality of care, mortality or patient satisfaction. Those with more general practitioners had lower overall healthcare costs for similar health outcomes and greater patient satisfaction (WHO 2008, Baicker and Chandra 2004, Baicker 2004). A systematic review comparing generalist and specialist care for single, discrete conditions found that specialists had better outcomes but the authors identified important methodological issues which cast doubt on these findings and point to the need for studies comparing generalists' and specialists' care for patients with multiple, chronic conditions (Smetana et al 2007).

Within health systems, primary health care and specialist services link together in a variety of ways. Some evidence is presented regarding specialist input into primary health care services. A review of specialist outreach clinics in primary care found that specialist outreach as part of a complex intervention involving primary care collaboration and education was associated with improved health outcomes (Gruen et al 2009). A review which compared the

use of selected specialist “vertical” services with the full integration of these services into primary care, found that integration of these services may decrease utilisation and client satisfaction and have no impact on health outcomes (Briggs and Garner 2006).

2. Data on specialist focus and health outcomes

Monitoring the skills mix of health workforce

WHO, 2009, Spotlight on health workforce statistics, Issue 9

http://www.who.int/hrh/statistics/spotlight_9_en.pdf

Data on medical workforce skills mix for selected countries were found in the Spotlight in health workforce statistics.

WHO Global Code of Practice on International Recruitment of Health Personnel. Pakistan implementation strategy.

WHO, 2011

http://www.who.int/workforcealliance/knowledge/resources/PAK_ImmigrationReport.pdf

The only further skills mix data found were from this WHO Pakistan health personnel report.

The World Bank Health Data

<http://data.worldbank.org/topic/health>

Outcome and cost data for corresponding countries were drawn from the World Bank

Table 1: Skills mix, health outcomes and expenditure for selected countries

Country	Percent of physicians who are specialists	Crude death rate (per 1000 population)	Maternal mortality ratio (per 100 000 live births)	Mortality rate, under-5 (per 1,000 live births)	Health expenditure per capita (current US\$)
Egypt	92	6	66	21	123
Bahrain	82	3	20	10	864
Burkina Faso	56	12	300	146	40
Indonesia	50	7	220	32	77
Algeria	47	5	97	30	178
Rwanda	33	12	340	54	56
Australia	32	6	7	5	4775
Sudan	31	21	730	86	84
Cameroon	17	14	690	127	61
Pakistan	16	7	260	72	22
Sri Lanka	8	7	35	12	70

The data analysis is very crude as there are many other aspects influencing mortality rates. The figures all suggest a weak negative relationship between the percent of health workforce that are specialists and mortality rates. However there are outliers and countries should be considered individually.

It is interesting to compare Sri Lanka and Egypt on the opposite ends of the scale of the skills mix. In Sri Lanka 8% of physicians are specialists and health spending is \$70 per capita. In Egypt 92% of physicians are specialists and health spending is \$123 per capita. The crude death rate is very similar, 7 and 6 (per 1000) respectively. The maternal and infant mortality rates are slightly lower in Egypt but not markedly considering the spread of the data.

Figure 1: Percent specialists and death rate

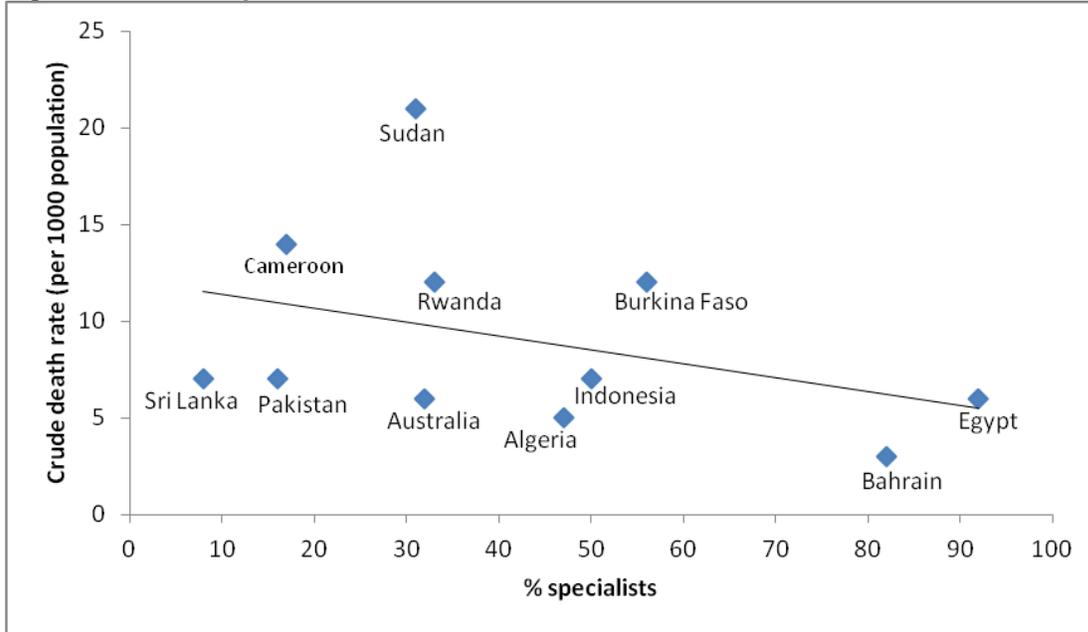


Figure 2: Percent specialists and maternal mortality

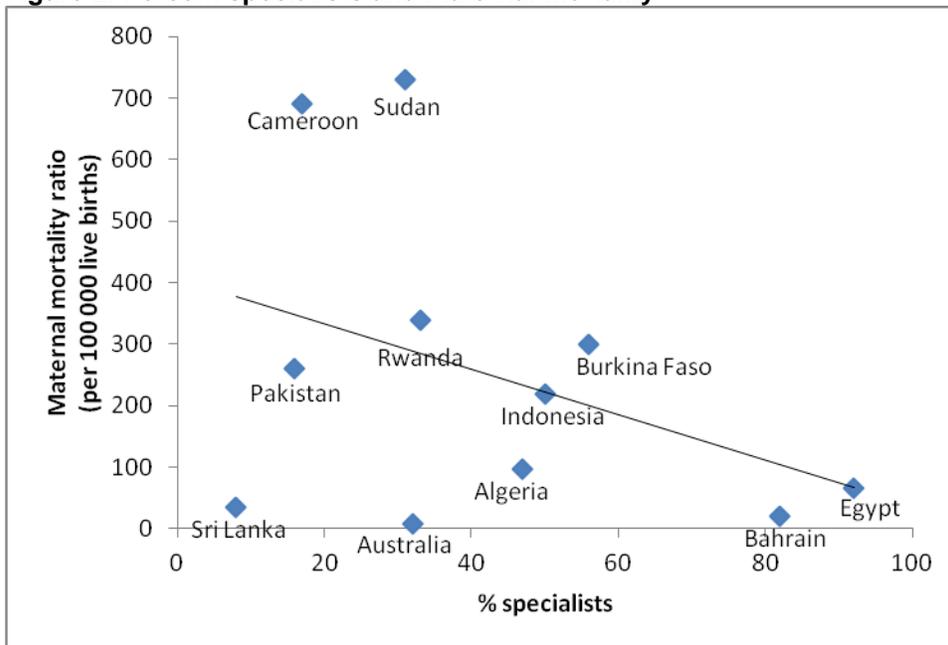
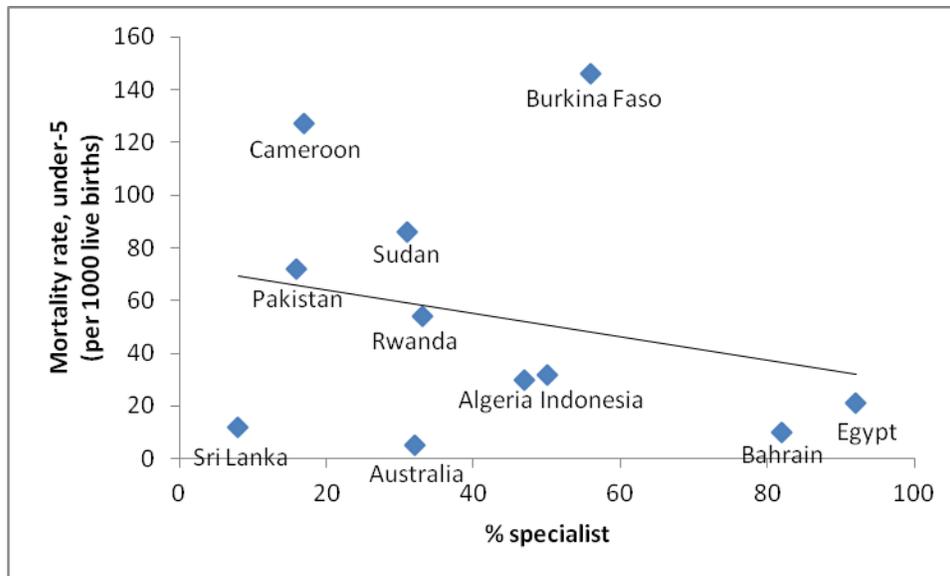


Figure 3: Percent specialists and infant mortality



3. Primary health care evidence: country-wide

The Impact of Primary Healthcare on Population Health in Low- and Middle-Income Countries.

Macinko J, Starfield B, Erinosh T. 2009. Journal of Ambulatory Care Management. Vol. 32 No.2 pp150-171

http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-primary-care-policy-center/Publications_PDFs/A238.pdf

This article assesses 36 peer-reviewed studies of the impact of primary healthcare (PHC) on health outcomes in low- and middle-income countries. Results indicate that the bulk of evidence for PHC effectiveness is focused on infant and child health, but there is also evidence of the positive role PHC has on population health over time.

There have been only a few studies that directly test the hypothesis that health systems based on a strong PHC orientation (based on PHC principles) lead to better overall indicators:

- In Costa Rica, PHC improvements beginning in the 1970s were estimated to have reduced infant mortality by between 40% and 75%. In the 1990s, additional Costa Rican reforms sought to improve PHC coverage and efficiency. For every 5 additional years after PHC reforms, child mortality declined by 13% and adult mortality by 4%.
- Brazil's Family Health Program is based on an explicit strategy to provide all core primary care functions, including first-contact access for each new need, long-term person-focused care, and comprehensive care for most health needs, coordinated care when it must be sought elsewhere, and a focus on the family and the community. A panel data analysis of Brazilian states from 1990 to 2002 showed that an increase in FHP coverage by 10% was associated with an average 4.6% decrease in infant mortality, controlling for other health determinants. A follow-up study conducted at the microregional level for 1999–2004 showed that the effect of FHP coverage was especially strong for conditions that are known to be sensitive to primary care (such as postneonatal mortality and deaths from diarrheal diseases). Costs for the program (which includes access to pharmaceuticals) are estimated at between \$25 and \$35.

Other countrywide observations are suggestive of the role of PHC in population health improvements, although these studies do not explicitly quantify the contribution of PHC to health improvements or explicitly test the impact of specific PHC interventions:

- Changes to Cuba's universal PHC program regarding access, organisation, and delivery over the past 40 years correspond to about a 40% decline in infant mortality over the same period. Investments in prevention integrated into PHC may also have contributed to the control of cardiovascular diseases, resulting in lower-than expected mortality and fewer avoidable hospitalisations for these and related conditions.
- In Mexico, child mortality declined from 64 per 1000 live births in 1980 to 23 per 1000 in 2006. These reductions were consequent to a strategy that began with a number of disease-specific programmes and expanded to a broader strategy that combined vertical programs with more comprehensive PHC and human development approaches. A study also found that in Mexico, primary care characteristics (such as adequate referral processes, continuity of care, being seen by the same provider, and being attended in a public facility) had an important, independent effect on reducing a child's odds of dying.
- In Thailand, decreases in under-5 infant mortality occurred after primary care reform which included developing at least 1 primary care health centre for every rural village by 1990. In the corresponding decade, under-5 mortality declined by 44% in the poorest population quintile, 41% in the next poorest quintile, 22% in the third, 23% in the fourth, and 13% in the wealthiest quintile.
- In Indonesia, a 20% reduction in infant mortality during the early 1990s has been attributed to improvements in PHC. Some evidence for this attribution comes from the observation that in the later 1990s, once primary care spending declined substantially (and hospital spending increased by almost 25%), infant mortality actually *increased* by 14% in almost every province of the country.
- A comparative case study assessed the relationship between a set of "Health for All" policies (health education, nutrition, water and sanitation, and maternal/child health services) and health outcomes at the national level in 4 African countries in the 1990s. This showed that PHC-sensitive conditions (such as infant mortality) were improved in the 2 countries with more comprehensive PHC policies (Botswana and Zimbabwe), as opposed to those with a less coherent set of PHC policies (Ghana and Cote d'Ivoire), in spite of the latter having higher gross national product per capita.

This review also includes studies analysing the association of specific primary care tasks with health outcomes and studies of specific primary care programs (see section #). In terms of outcomes, more than three quarters of the studies focused on infant or under-5 mortality, with the remainder dealing with maternal mortality, life expectancy, all cause mortality, and cause-specific mortality in adults. The magnitude of impact varied considerably. Reductions in infant and under-5 mortality attributed to PHC averaged more than 40% and varied from 0 to as high as 71%, with interventions lasting from 2 years to more than 10 years. Nearly all studies point to a positive impact of the PHC intervention studied. Five articles show no improvement attributable to PHC and several of these suggest a need for a more comprehensive approach to primary health care.

What are the advantages and disadvantages of restructuring a health care system to be more focused on primary care services?

Atun, R. 2004. Copenhagen, WHO Regional Office for Europe
http://www.euro.who.int/_data/assets/pdf_file/0004/74704/E82997.pdf

This is a Health Evidence Network (HEN) synthesis report on the advantages and disadvantages of restructuring a health care system to be more focused on primary care services.

Population Health and Aggregate Expenditure

A recent study assessing the contribution of primary care systems to a variety of health outcomes in 18 wealthy OECD countries over three decades revealed that the strength of a country's primary care system was negatively associated with population health outcomes such as all-cause mortality, all cause premature mortality, and cause-specific premature mortality from major respiratory and cardiovascular diseases. Stronger primary care meant better health outcomes. This relationship was significant even while controlling for determinants of population health at macro-level and micro-level.

In a comparative study in the United States, the availability of primary care physicians correlated positively to favourable health outcomes, including age-adjusted and standardised overall mortality, mortality associated with cancer and heart disease, neonatal mortality, and life expectancy, whereas absence of a primary care source was found to be the most important factor in determining poor health. In contrast, health systems dominated by specialists, such as that of the United States, have higher total health care costs and reduced access to health care by the vulnerable populations. The high cost is attributed to proportionately low numbers of primary care physicians and consequent impairment of the gate-keeping function.

Primary health care, when compared with secondary care, is a lower cost environment as services delivered by specialists are higher cost due to a tendency to use expensive technology and orientation to curative rather than preventive medicine.

In developing countries, systematic international data supporting a strong correlation between increased PHC spending or access and improved health outcomes is not strong, due to the inherent difficulty of disaggregating socio-economic and health system interventions.

Equity and Access

In low-income countries, evidence shows that expenditure on PHC is more pro-poor than aggregate expenditure that includes hospitals, and has a desirable distributive impact benefiting the poorer segment of the population proportionately more than the richer segment. Studies from developed countries demonstrate that an orientation towards a specialist-based system enforces inequity in access. In contrast, there is general agreement that expenditure on primary care improves equity. Greater investment in primary care increases access to care with associated lower mortality and morbidity. Conversely, a reduction in access to PHC results in a worsening health status.

Quality and efficiency of care

There is a paucity of rigorous studies evaluating the quality and cost effectiveness of care delivered in the primary care setting or by general practitioners. A substantial number of well-designed studies exist comparing care delivered by general practitioners to that by specialists. These show no significant difference in quality of care and health outcome for care delivered by general practitioners even when substituted for secondary care specialists. Primary care physicians are more likely than specialists to provide continuity and comprehensive care resulting in improved health outcomes.

The empirical evidence of what care can be readily shifted from specialist-led secondary care to PHC is limited. Some studies analysing substitution of selected services (for instance for hypertension and asthma) from secondary to primary care showed this shift to be more cost-effective, although others found contrasting or ambiguous results. For instance, a comparative analysis of quality and cost of depression treatment by primary care physicians and specialists shows the latter to be more effective but more costly.

The World Health Report 2008: Primary health care, now more than ever.

World Health Organization.2008
<http://www.who.int/whr/2008/en/>

In many high income countries (but not all), the PHC efforts of the 1980s and 1990s have been able to reach better balance between specialised curative care, first contact care and health promotion. Over the last 30 years, this has contributed to significant improvements in health outcomes. More recently, middle-income countries, such as Chile with its *Atención Primaria de Salud* (Primary Health Care), Brazil with its family health initiative and Thailand under its universal coverage scheme have shifted the balance between specialised hospital and primary care in the same way. The initial results are encouraging: improvement of outcome indicators combined with a marked improvement in patient satisfaction.

Evidence from comparisons between high-income countries shows that higher proportions of generalist professionals working in ambulatory settings are associated with lower overall costs and higher quality rankings. Conversely, countries that increase reliance on specialists have stagnating or declining health outcomes when measured at the population level, while fragmentation of care exacerbates user dissatisfaction and contributes to a growing divide between health and social services. Information on low- and middle-income countries is harder to obtain, but there are indications that patterns are similar. Some studies estimate that in Latin America and the Caribbean more reliance on generalist care could avoid one out of two hospital admissions. In Thailand, generalist ambulatory care outside a hospital context has been shown to be more patient-centred and responsive as well as cheaper and less inclined to over-medicalisation.

30 years after Alma-Ata: Has primary health care worked in countries?

Rohde, J et al.2008. The Lancet, Vol. 372 No.9642, pp 950–961.

<http://www.sciencedirect.com/science/article/pii/S0140673608614051>

This paper assesses progress for primary health care in countries since Alma-Ata. It focuses on the 30 low-income and middle-income countries with the highest average yearly reduction of mortality among children less than 5 years of age, describing coverage and equity of primary health care as well as non-health sector actions. These 30 countries have scaled up selective primary health care (eg, immunisation, family planning), and 14 have progressed to comprehensive primary health care. Good governance and progress in non-health sectors are seen in almost all of the 14 countries identified with a comprehensive primary health care system. These 30 countries include those that are making progress despite very low income per person, political instability, and high HIV/AIDS prevalence. Thailand has the highest average yearly reduction in mortality among children less than 5 years of age (8.5%) and is presented in the paper as a case study. Lessons learned from all these countries include the need for a nationally agreed package of prioritised and phased primary health care that all stakeholders are committed to implementing, attention to district management systems, and consistent investment in primary health-care extension workers linked to the health system.

Contribution of Primary Care to Health Systems and Health

Starfield, B., Shi, L. & Macinko, J. 2005. The Milbank Quarterly, Vol. 83, No. 3.

http://www.commonwealthfund.org/usr_doc/starfield_milbank.pdf

Studies in developing countries show the considerable potential of primary care to reduce the large disparities associated with socioeconomic deprivation. In seven African countries, the wealthiest 20 percent of the population receives well over three times as much financial benefit from overall government spending as does the poorest 20 percent of the population (40 percent versus 12 percent). For primary care services, the ratio of rich to poor in the distribution of government expenditures was notably lower (23 percent to the top group versus 15 percent to the lowest group), leading one international expert to conclude that

“from an equity perspective, the move toward primary care represents a clear step in the right direction”. An analysis of preventable deaths in children concluded that in the 42 countries accounting for 90 percent of child deaths worldwide, 63 percent could have been prevented by the full implementation of primary care. The primary care interventions included integrated care addressing the very common problems of diarrhoea, pneumonia, measles, malaria, HIV/AIDS, preterm delivery, neonatal tetanus, and neonatal sepsis.

Access to health care in developing countries: breaking down demand side barriers

O'Donnell, O. 2007. Cad. Saúde Pública vol.23 no.12

http://www.scielo.br/scielo.php?pid=S0102-311X2007001200003&script=sci_arttext

Where health care is available, the quality is often severely deficient, leaving its effectiveness well short of potential efficacy. One review concludes that, despite the claimed efficacy of primary health care interventions, the evidence is mixed on whether primary care clinics have any impact on population health. This discouraging conclusion is attributed to the poor quality of public primary health care in many parts of the developing world. As long as such quality deficiencies persist, the estimates cited in this paper of avoidable deaths through the utilisation of effective interventions will remain purely hypothetical.

Primary care, specialty care, and life chances

Shi L. 1994. International Journal of Health Services. Vol.24 No.3 pp 431-58.

<http://www.ncbi.nlm.nih.gov/pubmed/7928012>

The relationship between the availability of primary care and specialty care in states of the US and certain life chance indicators such as mortality rates and life expectancy is analysed in this study. Among the medical care variables, primary care is by far the most significant variable related to better health status, correlating with lower overall mortality, lower death rates due to diseases of the heart and cancer, longer life expectancy, lower neonatal death rate, and lower low birth weight. In contrast, the number of specialty physicians is positively and significantly related to total mortality, deaths due to heart diseases and cancer, shorter life expectancy, higher neonatal mortality, and higher low birth weight. From a policy perspective, a likely implication is to reorient the medical profession from its current expensive, clinically based, treatment-focused practice to a more cost-effective, prevention-oriented primary care system.

4. Specialist service focus: country-wide evidence

The World Health Report 2008: Primary health care, now more than ever.

World Health Organization. 2008

<http://www.who.int/whr/2008/en/>

The disproportionate focus on hospitals and sub-specialisation has become a major source of inefficiency and inequality, and one that has proved remarkably resilient. Obviously, well functioning specialised tertiary care responds to a real demand. However, the experience of industrialised countries has shown that a disproportionate focus on specialist, tertiary care provides poor value for money. Hospital-centrism carries a considerable cost in terms of unnecessary medicalisation and iatrogenesis, and compromises the human and social dimensions of health. It also carries an opportunity cost: Lebanon, for example, counts more cardiac surgery units per inhabitant than Germany, but lacks programmes aimed at reducing the risk factors for cardiovascular disease.

Weak Links in the Chain: A Diagnosis of Health Policy in Poor Countries

Filmer, D., Hammer, J.S. & Pritchett, L.H. 2000. The World Bank Research Observer, vol. 15, no. 2

<http://wbro.oxfordjournals.org/content/15/2/199.abstract>

The concept called primary health care, or health for all, enshrined at an international conference at Alma Ata (now Almaty, Kazakhstan) in 1978, has dominated much of the discussion of health policy in developing countries for the past two decades. The broad health problems this concept encompasses are pressing, and the solutions it calls for seem obvious. Yet in many developing countries the public budget for health is principally absorbed by public hospitals staffed by doctors expensively trained at public expense who use costly medical technologies to treat conditions of the urban elite, while in those same countries children die from diseases that could have been treated for a few cents or avoided altogether with basic hygienic practices. In developing countries in 1995, more than 9 million children under five years old—more than the entire population of Sweden or Zambia—died deaths that could have been avoided. Individual examples, however, show that primary health care efforts can be successful even in very poor regions. This combination of experiences has led to a strong consensus among public health specialists who focus on developing countries. They argue that the existing allocation of health expenditures toward curative care in secondary and tertiary facilities, such as hospitals and clinics to which patients are referred, is inappropriate and that a reorientation of government efforts toward primary health care would bring both health gains and cost savings. In this consensus primary health care is typically defined by what it is *not*: it is neither secondary nor tertiary curative care but could be *all* other activities related to health, from nutrition, to sanitation, information, and education, to clinic-based curative care. Even more ambitious definitions include empowerment and social equality.

5. Primary health care evidence: intervention-level

The Impact of Primary Healthcare on Population Health in Low- and Middle-Income Countries.

Macinko J, Starfield B, Erinosh T.2009. Journal of Ambulatory Care Management Vol. 32 No.2 pp150-171

http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-primary-care-policy-center/Publications_PDFs/A238.pdf

This review includes studies on specific primary care programs as well as country-wide studies.

- The Navrongo experiment in Ghana was the only experimental study identified. In it, villages received 1 of 4 different interventions: professional community nurses; voluntary community health workers (CHWs); a combination of both; and nothing (control). In the nurse-only intervention areas, under-5 mortality fell by 14% during 5 years of program implementation, compared with that before the intervention period. In the volunteer-only villages, under-5 mortality increased by 14%. The professional nurse intervention added approximately \$2 per capita to the \$6.80 per capita budgeted for PHC services.
- In the Gambia, PHC and non-PHC communities were compared over a 15- year period. The study found that although child mortality declined in intervention and control villages, the decline was generally steeper in PHC villages (Hill et al., 2000). As a type of natural experiment, the authors report that once PHC services were stopped in the villages (because of lack of funds), the trend reversed and infant mortality increased to levels higher than those in control (non-PHC) villages.

- In Haiti, the activities of an integrated local health system, based on a PHC model (the Hopital Albert Schweitzer or HAS), were associated with infant and under-5 mortality that are about half of those in other areas with similar income levels. In terms of resources, HAS had fewer physicians and fewer hospital beds per capita than did the rest of Haiti but more nurses, CHWs, and other outreach and support staff. The HAS system costs about \$19 per capita, including community development initiatives.
- In a cohort study conducted in Pondicherry, India, provision of a broad range of PHC services, including home visits by PHC nurses in 12 villages (total population of about 16 000), decreased infant and child mortality by more than 65%.
- In Bolivia, a comprehensive community-based PHC program (delivered by paid nurses and community volunteers with some physician support) serving a population of about 15 000 successfully reduced under-5 mortality by more than 52% over a 5- to 6-year period, as compared with control areas. Costs for the programme were estimated at about \$10 per person.

Several other studies which report positive outcomes for PHC programs are described in the review. The authors highlight that the definition of the PHC programs varied considerably, from the mere presence of a Volunteer Health Worker in a community to the use of specific services to the development of an integrated network of health and social services in the community.

Primary health care as a strategy for achieving equitable care: a literature review commissioned by the Health Systems Knowledge Network.

De Maeseneer J et al. 2007. World Health Organization, Commission on the Social Determinants of Health.

http://www.who.int/social_determinants/resources/csdh_media/primary_health_care_2007_en.pdf

In the US, higher ratios of primary care physicians to population are associated with relatively greater effects on various aspects of health in more socially deprived areas (as measured by high levels of income inequalities). Areas in the USA with abundant primary care resources and high income inequality have a 17% lower post-neonatal mortality rate (compared with the population means), whereas the post-neonatal mortality rate in areas of high income inequality and few primary care resources was 7% higher. For stroke mortality, the comparable figures were 2% lower in mortality when the primary care resources were abundant and 1% higher when the primary care resources were scarce. People in high income inequality areas were 33% more likely to report fair or poor health if the primary care resources were few. As in state-level analyses, the adverse impact of income inequality on all-cause mortality, heart disease mortality and cancer mortality was considerably diminished where the number of primary care physicians in county-level analysis was high.

A study in Bolivia found that the community based approach to plan primary health care services in socially deprived areas lowered the mortality of children under age 5 compared with adjacent similar areas of the country as a whole.

In Kerala (India), 74% of the population lives in a village with a primary health care centre. Their infant mortality rate is 16 per 1000 live births. By contrast, in Uttar Pradesh State, only 4% of the population has access to PHC, and the infant mortality rate is 87 per 1000 births.

Weak Links in the Chain: A Diagnosis of Health Policy in Poor Countries

Filmer, D., Hammer, J.S. & Pritchett, L.H. 2000. The World Bank Research Observer, vol. 15, no. 2

<http://wbro.oxfordjournals.org/content/15/2/199.abstract>

Individual examples show that primary health care efforts can be successful even in very poor regions Kerala, a state in India with annual per capita income of only \$1,254 in purchasing power parity dollars, has an infant mortality rate of only 31 per 1,000 live births. This rate is not only 40 percent lower than that in Punjab, another Indian state with twice Kerala's income, but 35 percent lower than that in Brazil, which has more than four times Kerala's per capita income. Infant mortality in Shanghai, China, is lower than in Manhattan, and the recorded infant mortality rate of 16 in Jamaica is lower than that of African-Americans in the United States. Ceara, one of the poorest states in Brazil, reduced infant mortality by 36 percent in just a few years through an aggressive government program.

6. Evidence on generalist and specialist practitioners

The World Health Report 2008: Primary health care, now more than ever.

World Health Organization.2008. <http://www.who.int/whr/2008/en/>

Studies show that generalists adhere to clinical practice guidelines to the same extent as specialists, although they are slower to adopt them. They prescribe fewer invasive interventions, fewer and shorter hospitalisations and have a greater focus on preventive care. This results in lower overall health-care costs for similar health outcomes and greater patient satisfaction.

The Productivity of Physician Specialization: Evidence from the Medicare Program

Baicker, K. & Chandra, A. 2004. American Economic Review, Vol. 24 no. 2

<http://www.aeaweb.org/articles.php?doi=10.1257/0002828041301461> (restricted access)

Areas with more specialists spend more on health care for Medicare beneficiaries but see no improvement in the quality of care, mortality, or patient satisfaction. Do these results imply that having a more specialised physician workforce in an area causes higher spending and less efficient care, and that we need more family practitioners and fewer specialists? We cannot draw those conclusions from this analysis. Areas with more specialization in health care may be different from other areas along many dimensions.

Medicare Spending, The Physician Workforce, And Beneficiaries' Quality Of Care

Baicker, K. 2004. Health Affairs, Vol. 23, no. 3

<http://content.healthaffairs.org/content/early/2004/04/07/hlthaff.w4.184.short>

The quality of care received by Medicare beneficiaries varies across areas. We find that states with higher Medicare spending have lower-quality care. This negative relationship may be driven by the use of intensive, costly care that crowds out the use of more effective care. One mechanism for this trade-off may be the mix of the provider workforce: States with more general practitioners use more effective care and have lower spending, while those with more specialists have higher costs and lower quality. Improving the quality of beneficiaries' care could be accomplished with more effective use of existing dollars.

A Comparison of Outcomes Resulting From Generalist vs Specialist Care for a Single Discrete Medical Condition: A Systematic Review and Methodologic Critique.

Smetana G et al.2007. Archives of Internal Medicine Vol.167 No.1 pp10-20.

<http://archinte.jamanetwork.com/article.aspx?articleid=411483>

This systematic review compares generalist and specialist care for single, discrete conditions. 24 of 49 studies suggest better outcomes with specialists and only 4 studies suggest that generalist care is superior. However, the authors' detailed examination of the methodology of these studies casts doubt on these findings. Only 14 of the 24 studies favouring specialist care adequately considered patient selection bias. Only 3 studies considered the potential effects of the practice environment as a potential confounding factor. The authors state that the seemingly substantive evidence favouring specialised care of discrete conditions becomes far less compelling when these important methodological issues are considered. The dearth of studies comparing generalist vs specialist care of patients with multiple chronic conditions, a traditional strength of generalism, is another important omission in the literature.

They suggest that further research enables comparison of generalists and specialists in health care systems that provide care for patients with complex diagnoses who require extensive coordination. They conclude that while the many benefits of highly specialized services are indisputable, well-supported generalist practice remains a critical element of the health care system, not just for acute illness care but also for the management of the many patients with chronic illness.

7. Evidence on specialist services within primary care

Specialist outreach clinics in primary care and rural hospital settings

Gruen RL, Weeramanthri TS, Knight SS, & Bailie RS. 2009. The Cochrane Collaboration. <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003798.pub2/pdf/standard>

This review examines the benefits and costs of outreach in a range of specialties and in a variety of settings. Simple 'shifted outpatients' styles of specialist outreach were shown to improve access, but there was no evidence of their impact on health outcomes. Outreach as part of more complex multifaceted interventions involving primary care collaborations, education and other services was associated with improved health outcomes, more efficient and guideline-consistent care, and less use of inpatient services. There is a need for better quality evidence evaluating specialist outreach in all settings, but especially in rural and disadvantaged populations.

Evidence informed community healthcare in developing countries: is there a role for tertiary care specialists?

Asokan N, Praveenlal K, Shaji K. 2011. National Journal of Community Medicine Vol 2 No.3 http://njcmindia.org/uploads/2-3_496-497.pdf

This letter describes a model of primary health care being developed in Kerala, India, in which community health volunteers and specialists from tertiary care work together to address health problems including diabetes, hypertension, depression, dementia and skin diseases. The author identifies that some countries like the United Kingdom incorporate training in various specialties within the training of General Practitioners (GP). Creation of General Practitioners with a Special Interest (GPwSI) who supplement their main GP role by delivering an additional high quality service in a particular area of expertise helps to achieve the aim of delivering evidence informed health care to the community. But in most of the developing countries including India, such systems are non-existent. These countries need to develop new models to link the primary care team to a network of experts from secondary and tertiary levels of care.

Strategies for integrating primary health services in middle and low-income countries at the point of delivery

Briggs CJ, Garner P. 2006. Cochrane Database of Systematic Reviews, (3):CD003318. <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003318.pub3/abstract>

In some low- and middle-income countries, separate vertical programmes deliver specific life-saving interventions but can fragment services. This review examined the evidence on the effectiveness of integration strategies at the point of delivery, including integrated delivery of tuberculosis (TB), HIV/AIDS and reproductive health programmes.

Five studies added an additional component, or linked a new component, to an existing service, for example, adding family planning or HIV counselling and testing to routine services. The evidence from these studies indicated that adding on services probably increases service utilisation but probably does not improve health status outcomes, such as incident pregnancies.

Four studies compared integrated services to single, special services. Based on the included studies, fully integrating sexually transmitted infection (STI) and family planning, and maternal and child health services into routine care as opposed to delivering them as special 'vertical' services may decrease utilisation, client knowledge of and satisfaction with the services and may not result in any difference in health outcomes, such as child survival. Integrating HIV prevention and control at facility and community level improved the effectiveness of certain services (STI treatment in males) but resulted in no difference in health seeking behaviour, STI incidence, or HIV incidence in the population. More rigorous studies of different strategies to promote integration over a wider range of services and settings are needed.

8. Additional information

Author

This query response was prepared by Laura Bolton and Imogen Featherstone

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