Measuring Primary Care and Its Benefits

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Life Expectancy Compared with GDP per Capita for Selected Countries


Country codes:
AG=Argentina, AU=Australia, BZ=Brazil, CH=China, CN=Canada, FR=France, GE=Germany, HU=Hungary, IN=India, IS=Israel, IT=Italy, JA=Japan, MA=Malaysia, ME=Mexico, NE=Netherlands, PO=Poland, RU=Russia, SA=South Africa, SI=Singapore, SP=Spain, SW=Sweden, SZ=Switzerland, TK=Turkey, TW=Taiwan, UK=United Kingdom, US=United States.
Why Is Primary Care Important?

Better health outcomes
Lower costs
Greater equity in health
Good Primary Care Requires

• Health system POLICIES conducive to primary care practice: What can we learn from other countries about the relative merits of direct provision of services rather than just financing of services?

• Health services delivery that achieves the important FUNCTIONS of primary care: What can be done to enhance practitioners’ recognition of and responsiveness to patients’ problems (patient-focus) rather than on the professional priorities of diagnoses (diagnosis-focus)?
PRIMARY HEALTH CARE “works” because it has definable system functions that provide the policy context for primary care.

PRIMARY CARE “works” because it has defined functions that include structural and process features of clinical health services that are known to improve outcomes of care.
Key system factors in achieving primary health care in both developing and industrialized countries are:

- Universal financial coverage, under governmental control or regulation
- Efforts to distribute resources equitably (according to degree of need)
- No or low co-payments
- Comprehensiveness of services

System (PHC) and Practice (PC) Characteristics
Facilitating Primary Care, Early-Mid 1990s

*Best level of health indicator is ranked 1; worst is ranked 13; thus, lower average ranks indicate better performance.

Based on data in Starfield & Shi, Health Policy 2002; 60:201-18.
At the clinical level,

• The critical structural features are Accessibility, mechanisms of Continuity/Information Systems, and the Range of Services available in primary care.

• The critical process features are Problem Recognition on the part of practitioners (both for initial problems and for reassessment), and Utilization of primary care services, both over time and for new problems as they arise.

Together, these features achieve the evidence-based FUNCTIONS of primary care: first contact, person-focused (not disease-focused) care over time, comprehensiveness, and coordination.
Primary Care Strength and Premature Mortality in 18 OECD Countries

*Predicted PYLL (both genders) estimated by fixed effects, using pooled cross-sectional time series design. Analysis controlled for GDP, percent elderly, doctors/capita, average income (ppp), alcohol and tobacco use. $R^2(\text{within})=0.77$.

Primary Care Oriented Countries Have

- Fewer low birth weight infants
- Lower infant mortality, especially postneonatal
- Fewer years of life lost due to suicide
- Fewer years of life lost due to “all except external” causes
- Higher life expectancy at all ages except at age 80

Primary Care Score vs. Health Care Expenditures, 1997

Starfield 11/06
ICTC 3495 n
Primary health care oriented countries

- Have more equitable resource distributions
- Have health insurance or services that are provided by the government
- Have little or no private health insurance
- Have no or low co-payments for health services
- Are rated as better by their populations
- Have primary care that includes a wider range of services and is family oriented
- Have better health at lower costs

Sources: Starfield and Shi, Health Policy 2002; 60:201-18.
Is Primary Care as important within countries as it is among countries?
State Level Analysis:
Primary Care and Life Expectancy

Many other studies done WITHIN countries, both industrialized and developing, show that areas with better primary care have better health outcomes, including total mortality rates, heart disease mortality rates, and infant mortality, and earlier detection of cancers such as colorectal cancer, breast cancer, uterine/cervical cancer, and melanoma. The opposite is the case for higher specialist supply, which is associated with worse outcomes.

Why Does Primary Care Enhance Effectiveness of Health Services?

- Greater accessibility
- Better person-focused prevention
- Better person-focused quality of clinical care
- Earlier management of problems (avoiding hospitalizations)
- The accumulated benefits of the four features of primary care

Does primary care reduce inequity in health?
In the United States, an increase of 1 primary care doctor is associated with 1.44 fewer deaths per 10,000 population.

The association of primary care with decreased mortality is greater in the African-American population than in the white population.

A comparison of age-adjusted survival from breast cancer showed that

- Low SES is strongly associated with decreased survival in US, but not Canada.
- The survival advantage in Canada is present in low income areas only.
- The survival advantage in Canada is much larger at ages under 65.
- The Canadian survival advantage is larger for later stage diagnosis. That is, there is almost certainly a medical care benefit to equity in the Canadian context.

Why Does Primary Care Enhance Equity in Health?

- Greater comprehensiveness of services (especially important in the presence of multi-morbidity)
- Person-focused care over time (better knowledge of patient and better recognition of problems)
- Greater accessibility of services
- Better coordination, thus facilitating care for people of limited flexibility
- Better person-focused prevention

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In 35 US analyses dealing with differences between types of areas (7) and 5 rates of mortality (total, heart, cancer, stroke, infant), the greater the primary care physician supply, the lower the mortality for 28. The higher the specialist ratio, the higher the mortality in 25.

Above a certain level of specialist supply, the more specialists per population, the worse the outcomes.

Controlled only for income inequality
Use of Specialists in the US

• REFERRAL rates from primary care to specialty care in the US are HIGH.

• Between 1/3 and 3/4 (depending on the type of specialist) of visits to specialists are for routine follow-up.

• The percentage of people SEEN BY a specialist in a year is high, especially in the presence of high morbidity burden.

Resource Use, Controlling for Morbidity Burden*

- More DIFFERENT specialists seen: higher total costs, medical costs, diagnostic tests and interventions, and types of medication
- More DIFFERENT generalists seen: higher total costs, medical costs, diagnostic tests and interventions
- More generalists seen (LESS CONTINUITY): more DIFFERENT specialists seen among patients with high morbidity burdens. The effect is independent of the number of generalist visits. That is, the benefits of primary care are greatest for people with the greatest burden of illness.

*Using the Johns Hopkins Adjusted Clinical Groups (ACGs)
A nationally representative study showed that adults and children with a family physician (rather than a general internist, pediatrician, or sub-specialist) as their regular source of care had lower annual cost of care, made fewer visits, had 25% fewer prescriptions, and reported less difficulty in accessing care, even after controlling for case-mix, demographic characteristics (age, gender, income, race, region, and self-reported health status). Half of the excess is in hospital and ER spending; one-fifth is in physician payments; and one-third is for medications.

We know that

1. Inappropriate referrals to specialists lead to greater frequency of tests and more false positive results than appropriate referrals to specialists.

2. Inappropriate referrals to specialists lead to poorer outcomes than appropriate referrals.

3. The socially advantaged have higher rates of visits to specialists than the socially disadvantaged.

4. The more the training of MDs, the more the referrals.

A MAJOR ROLE OF PRIMARY CARE IS TO ASSURE THAT SPECIALTY CARE IS MORE APPROPRIATE AND, THEREFORE, MORE EFFECTIVE.

van Doorslaer et al, Health Econ 2004; 13:629-47;
Joint Principles of the Patient-centered Medical Home

- Personal physician: ongoing relationship for first contact, continuous, comprehensive care
- Physician directed medical practice
- Whole person oriented
- Coordinated and/or integrated care
- Quality and safety
- Enhanced access
- Added value payment

Proposed PC/MH (Patient-centered Medical Home) Criteria

- Electronic health record
- Teams
- Chronic care guidelines

Question: Do these “enhancements” improve primary care?

This requires evaluation.
Is a Focus on Chronic Disease Compatible with the Patient-Centered Medical Home?

In Pennsylvania, the Governor’s Office of Health Care Reform convened several health plans and physician societies in the southeastern part of the state to “institute a PCMH approach to manage the care of chronically ill patients”.

To what extent is this approach consistent with the principles of population-oriented primary care and the patient-centered medical home? Who is left out?
There is more variability in disease manifestations and persistence within diseases than across diseases because:

• diseases are not necessarily unique pathophysiological entities
• variability in diagnostic styles and practices
• presence of co-morbidity
Co- and Multi-morbidity (Morbidity Burden)
Co-morbidity is the concurrent existence of one or more unrelated conditions in an individual with any given condition. Multi-morbidity is the co-occurrence of biologically unrelated illnesses.

For convenience and by common terminology, we use co-morbidity to represent both co- and multi-morbidity.
Morbidity Burdens of Socially Disadvantaged and Socially Advantaged People

6-9 Morbidity Types

10+ Morbidity Types

% of Total Population

HMO

CHC (Disadvantaged)

Starfield 09/07
CM 3866 n
The high frequency of Co-morbidity
Multi-morbidity
Morbidity burden
makes it inappropriate to focus on single diseases
Co-morbidity, Inpatient Hospitalization, Avoidable Events, and Costs*

### Expected Resource Use (Relative to Adult Population Average) by Level of Co-Morbidity, British Columbia, 1997-98

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute conditions only</td>
<td>0.1</td>
<td>0.4</td>
<td>1.2</td>
<td>3.3</td>
<td>9.5</td>
</tr>
<tr>
<td>Chronic condition</td>
<td>0.2</td>
<td>0.5</td>
<td>1.3</td>
<td>3.5</td>
<td>9.8</td>
</tr>
<tr>
<td>High impact chronic condition</td>
<td>0.2</td>
<td>0.5</td>
<td>1.3</td>
<td>3.6</td>
<td>9.9</td>
</tr>
</tbody>
</table>

Thus, it is co-morbidity, rather than presence or impact of chronic conditions, that generates resource use.

As thresholds for diagnosing disease are lowered over time, the variability within “diseases” will increase even further, as will the prevalence of multiple simultaneous or sequential diseases.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage Change, 1987-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperlipidemia</td>
<td>437</td>
</tr>
<tr>
<td>(Heart disease)</td>
<td>9</td>
</tr>
<tr>
<td>Bone disorders</td>
<td>227</td>
</tr>
<tr>
<td>Upper GI problems</td>
<td>169</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>161</td>
</tr>
<tr>
<td>Mental problems</td>
<td>136</td>
</tr>
<tr>
<td>Diabetes</td>
<td>64</td>
</tr>
<tr>
<td>Endocrine disorders</td>
<td>24</td>
</tr>
<tr>
<td>Hypertension</td>
<td>17</td>
</tr>
<tr>
<td>Bronchitis</td>
<td>13</td>
</tr>
</tbody>
</table>

What is needed is person-focused care over time, NOT disease-focused care.
When people (not diseases) are the focus of attention

- Outcomes are better
- Side effects are fewer
- Costs are lower
- Population health is greater

What Is the Appropriate Care Model?

- Primary care that meets primary care (not disease-specific) standards*
- Specialty referrals that are appropriate, i.e., evidence-based**
- Specialty care that meets specialty care standards**

*exist
**do not exist
Modern medicine is largely atheoretical. With the exception of a few rare genetic conditions, we do not understand why some people have greater susceptibility to disease and, particularly why some people are more prone to multimorbidity than other people. On the other hand, some people seem to be more resilient to health problems. Why?
Diseases

• are professional constructs
• can be and are artificially created to suit special interests; the sum of deaths attributed to diseases exceeds the number of deaths
• do not exist in isolation from other diseases and are, therefore, not an independent representation of illness
• are but one manifestation of ill health

Despite large improvements in behavior of populations from the 1970s to the 1990s (e.g., a very large decrease in consumption of fats as a proportion of energy), the prevalence of obesity and diabetes increased greatly. Researchers have linked a growing number of chronic diseases (type 2 diabetes, coronary artery disease, stroke, non-alcoholic liver disease, fatty liver disease, polycystic ovary syndrome, asthma, some cancers, and Alzheimer’s disease) to the metabolic disorder known as insulin resistance, with widely divergent views of the pathogenesis by which it occurs.

What characterizes illness is its variability, not its average manifestations. Virtually all of the conclusions of randomized controlled clinical trials are based on the average response. Variability, which underlies the genesis of illness, the role of risk factors, and the impact of interventions, goes unrecognized.
If many people with relatively low risk are subjected to the same interventions (e.g., the polypill) as those with high risk, two of the three principles of prevention (avoiding unintended effects and low cost-effectiveness) will be violated.
Ambulatory Diagnostic Groups (ADGs)

Time limited (4)

Likely to recur (3)

Chronic medical (2)
Chronic specialty (6)

Injuries (2)
Psychosocial/psychophysiologic (3)
Signs/symptoms (3)

Allergies
Asthma
Malignancy
Dermatologic
Discretionary
See and reassure
Preventive/administrative
Pregnancy
Dental

Total number of ADGs = 32
Going from ADGs to ACGs

• During a single year, a patient’s diagnoses may fall into as many as 32 distinct ADGs. The potential permutations are vast. For practicality, a case-mix system must have a manageable number of mutually-exclusive categories.

• Clinically similar ADGs are combined into CADGs (collapsed ADGs).

• Individual CADGs and the most common combinations are designated as MACs (Major Ambulatory Categories) with one additional MAC for “all other combinations”.

• ACGs are formed from the MACs, based upon relative contributions to resources use.

• Some ACGs are subgroups of a MAC based on
  – age and/or sex
  – total number of ADGs
  – total number of major ADGs
Decision Tree for ACGs

Provides warning if:
Gender = Male, Age < 10 or age > 55

# of ADGs

ACG 1710
Delivered?
Yes
ACG 1711
No
ACG 1712

ACG 1720
Delivered?
Yes
ACG 1721
No
ACG 1722

ACG 1730
Delivered?
Yes
ACG 1731
No
ACG 1732

ACG 1740
Delivered?
Yes
ACG 1741
No
ACG 1742

ACG 1750
Delivered?
Yes
ACG 1751
No
ACG 1752

ACG 1760
Delivered?
Yes
ACG 1761
No
ACG 1762

ACG 1770
Delivered?
Yes
ACG 1771

Note: This level of branching is optional

Key
MAC  Major Ambulatory Category
ADG  Ambulatory Diagnostic Group
ACG  Ambulatory Care Group

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AC 1092
Decision Tree for MAC 26 – Infants

Note: This level of branching is optional

MAC    Major Ambulatory Category
ADG    Ambulatory Diagnostic Group
ACG    Ambulatory Care Group

Key

ACG 5310
ACG 5320
ACG 5330
ACG 5340

ACG 5311
ACG 5312
ACG 5321
ACG 5322
ACG 5331
ACG 5332
ACG 5341
ACG 5342

* Low birth weight refers to infants less than 2500 grams

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AC 1093
Figure 1: Decision Tree for ACGs

Figure 2: Decision Tree for MAC 24 -- Multiple ADG categories

Figure 3: Decision Tree for MAC 26 -- Infants

Figure 4: Decision Tree for MAC 24 -- Pregnant women

* Low Birthweight refers to infants less than 2500 grams.