The Challenging Face of Primary Care

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Keynote Address
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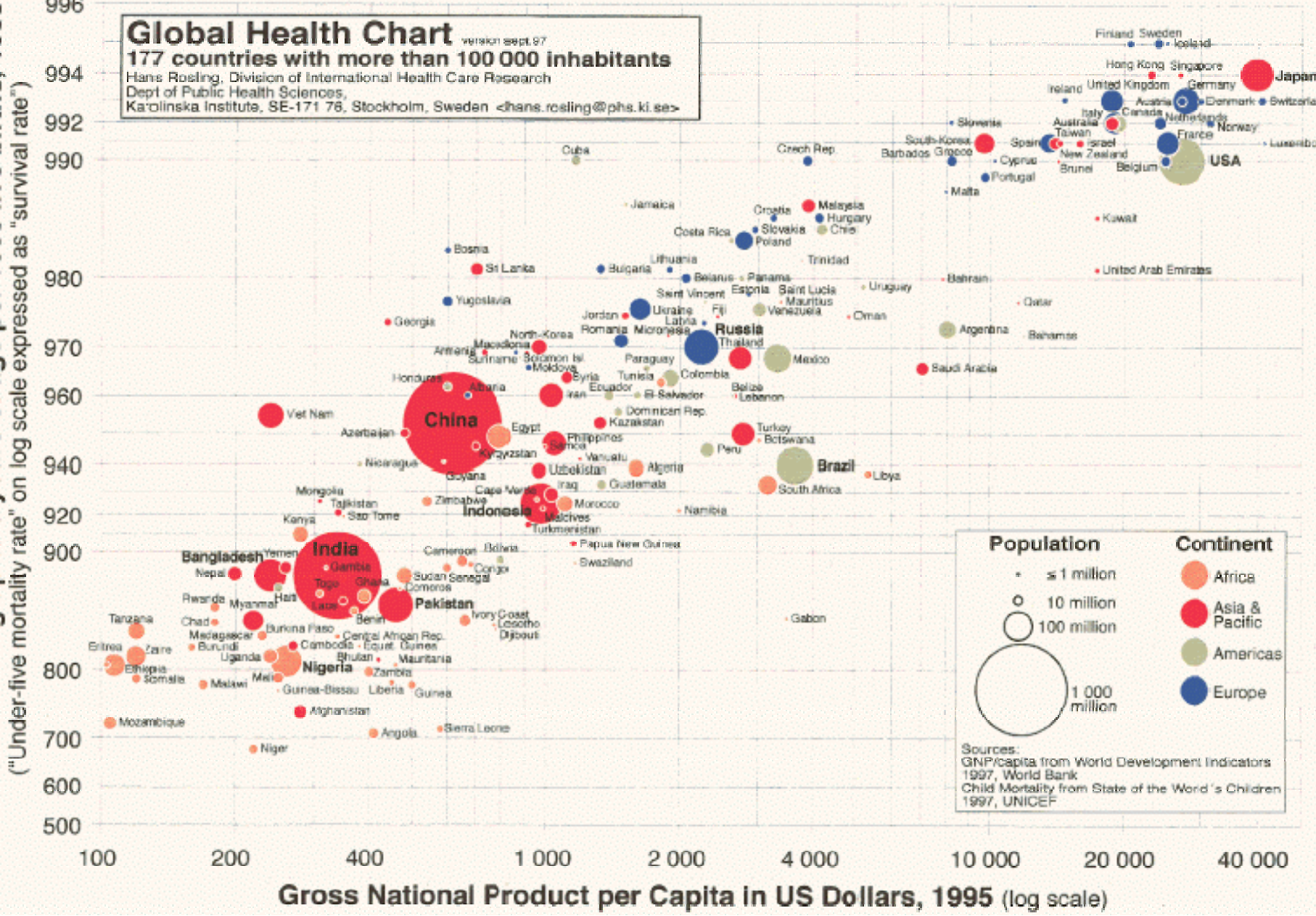
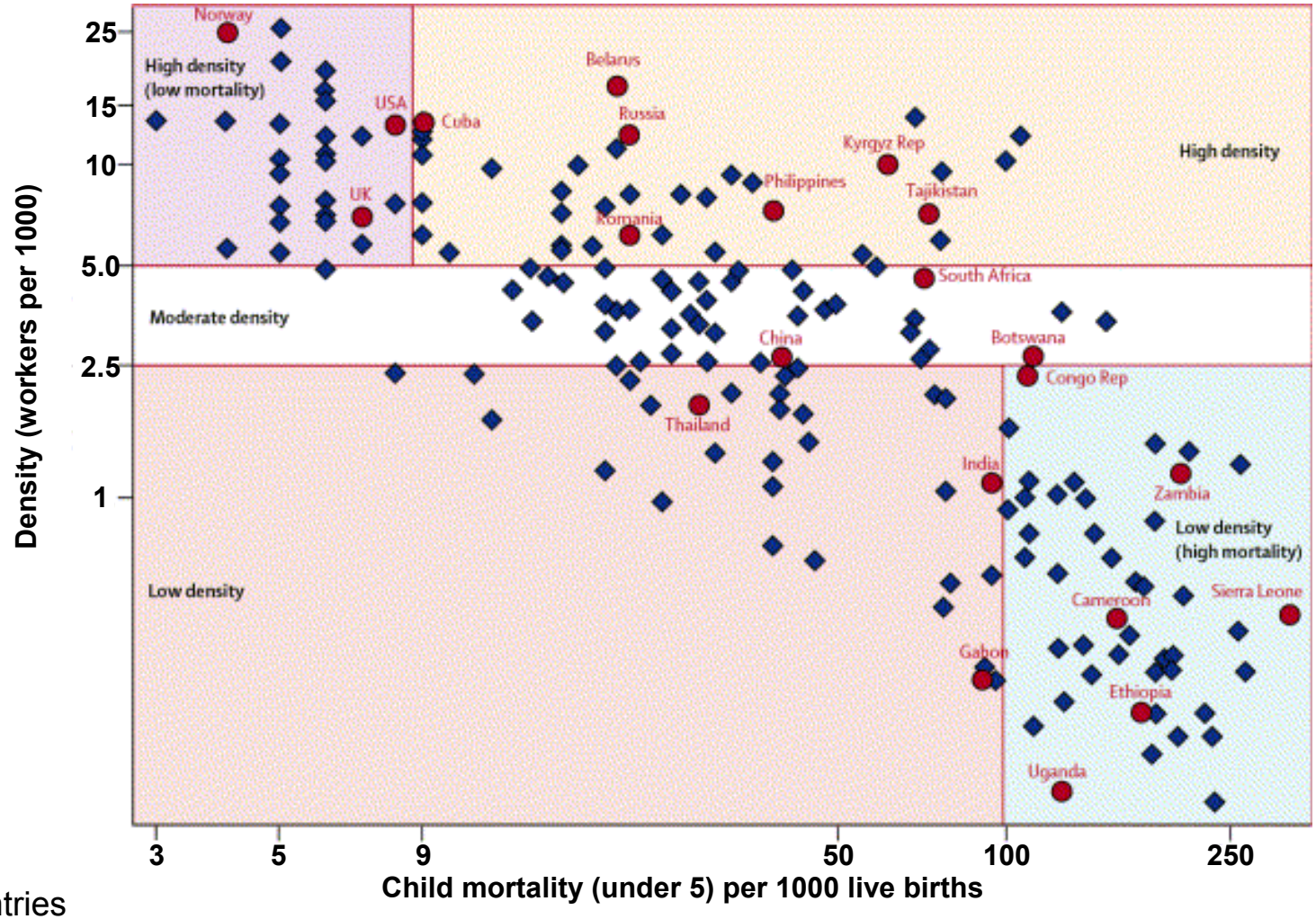


Source: Karolinska Institute: www.whc.ki.se/index.php

Starfield 09/04
IC 2941

Country* Clusters: Health Professional Supply and Child Survival

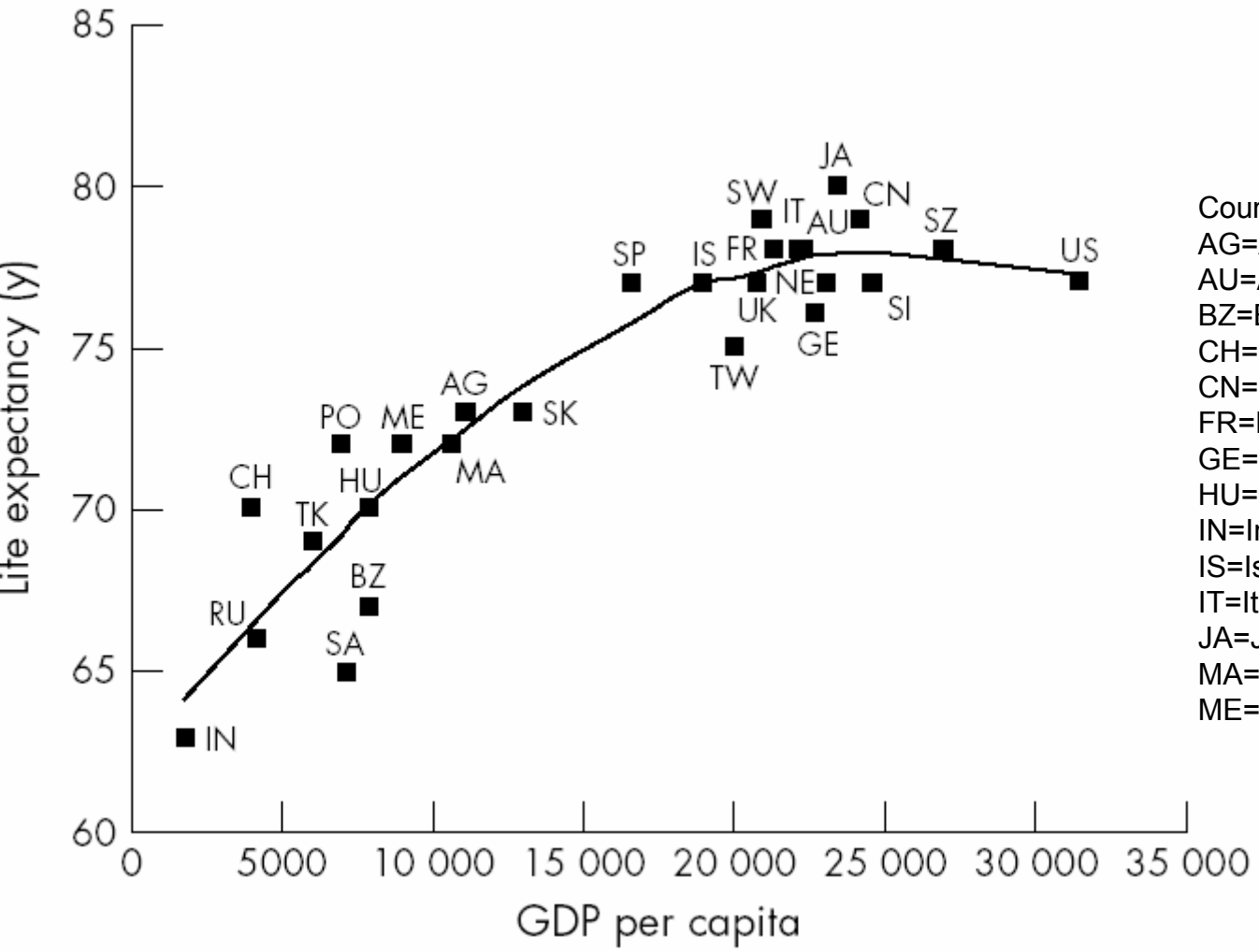


186 countries

Source: Chen et al. Lancet 2004; 364:1984-90

Starfield 12/04
HS 3083

Life Expectancy Compared with GDP per Capita for Selected Countries



Country codes:

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

Source: Economist Intelligence Unit. Healthcare International. 4th quarter 1999. London, UK: Economist Intelligence Unit, 1999.

Health systems have several major components:

- Public health activities
- Primary care
- Specialty care

We know little about what their interrelationships should optimally be.

Primary health care is primary care applied on a population level. As a population strategy, it requires the commitment of governments to develop a population-oriented set of primary care services in the context of other levels and types of services.

Primary care is the provision of first contact, person-focused ongoing care over time that meets the health-related needs of people, referring only those too uncommon to maintain competence, and coordinates care when people receive services at other levels of care.

Why Is Primary Care Important?

Better health outcomes

Lower costs

Greater equity in health

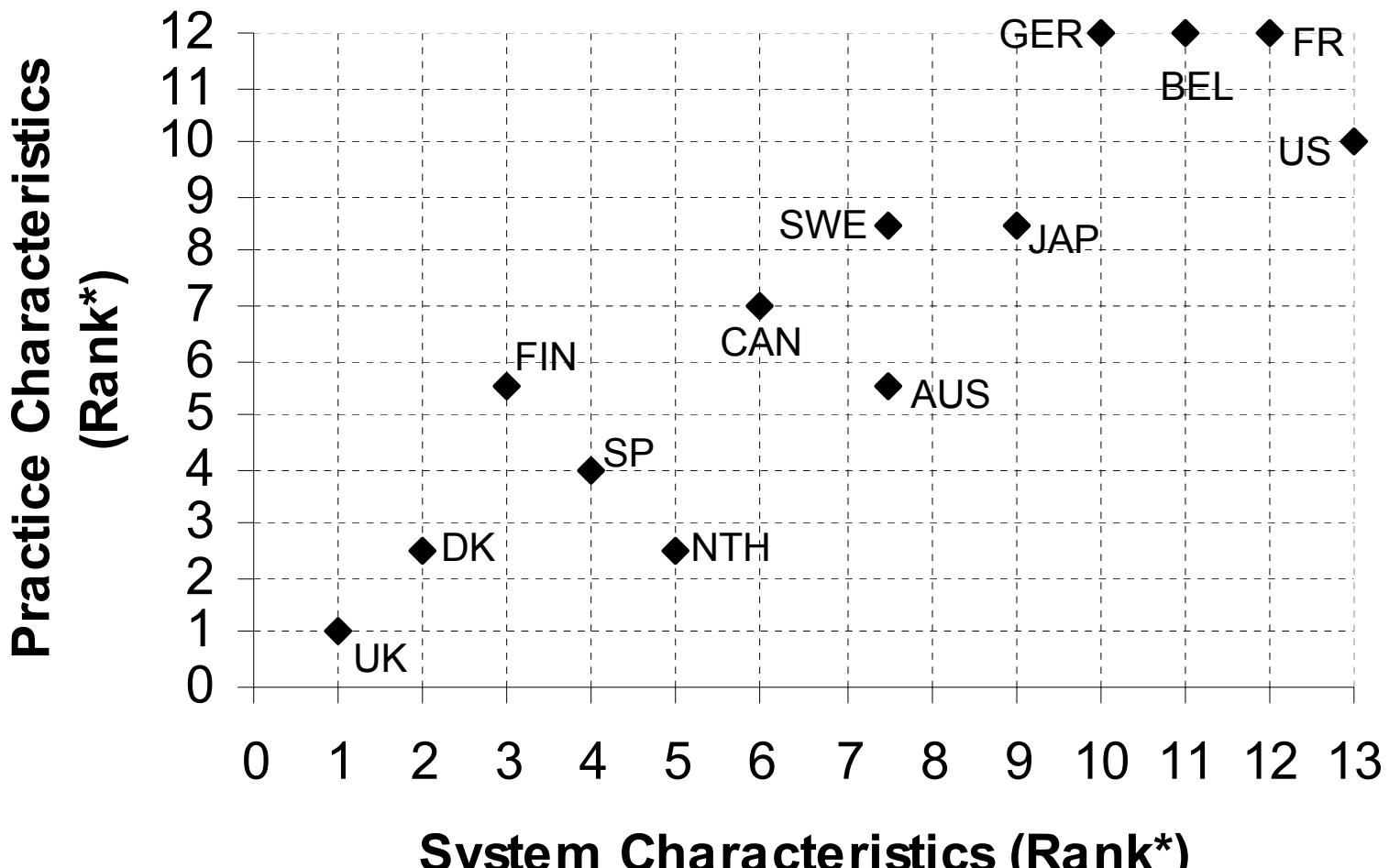
Evidence of the Benefits of a Primary Care-Oriented Health System

Primary Care Scores, 1980s and 1990s

	1980s	1990s
Belgium	0.8	0.4
France*	-	0.3
Germany	0.5	0.4
United States	0.2	0.4
Australia	1.1	1.1
Canada	1.2	1.2
Japan*	-	0.8
Sweden	1.2	0.9
Denmark	1.5	1.7
Finland	1.5	1.5
Netherlands	1.5	1.5
Spain*	-	1.4
United Kingdom	1.7	1.9

Scores available only for the 1990s

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

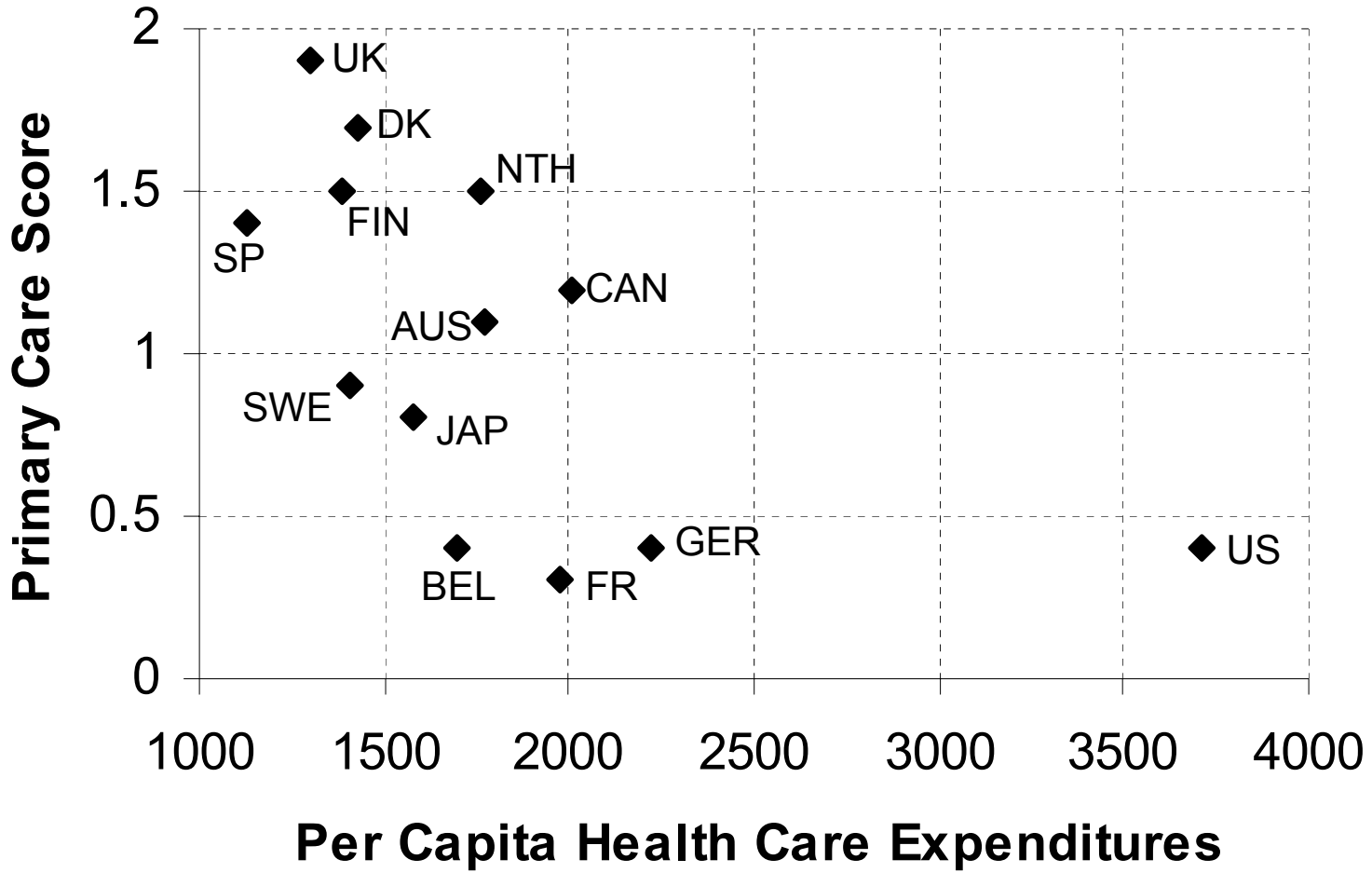


Best level of health indicator is ranked 1; worst is ranked 13;
hus, lower average ranks indicate better performance.

Based on data in Starfield & Shi, Health Policy 2002; 60:201-18

Starfield 03/05
IC 3100

Primary Care Score vs. Health Care Expenditures, 1997



Starfield 10/00
IC 1731

Average Rankings* for Health Indicators in Infancy, for Countries Grouped by Primary Care Orientation

	Low Birth Weight (1993)	Neonatal Mortality (1993)	Postneonatal Mortality (1993)	Infant Mortality (1996)
Worse primary care (Belgium, France, Germany, US)	**9.5**	**7.8**	**11.5**	**8.8**
Better primary care (Australia, Canada, Japan, Sweden, Denmark, Finland, Netherlands, Spain, UK**)	**5.9**	**6.7**	**5.0**	**6.2**

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

**England and Wales only

Based on data in Starfield & Shi, Health Policy 2002; 60:201-18

Average Rankings* for YPLL in Countries Grouped by Primary Care Orientation

	Suicide		All Except External	
	Female	Male	Female	Male
Worse primary care (Belgium, France, Germany, US)	7.3	8.3	8.8	10.8
Better primary care (Australia, Canada, Japan, Sweden, Denmark, Finland, Netherlands, Spain, UK**)	6.9	6.3	6.2	5.4

Best level of health indicator is ranked 1; worst is ranked 13;
hus, lower average ranks indicate better performance.
*England and Wales only

Calculated from: OECD Health Data 1998, Starfield & Shi, Health Policy 2002; 60:201-18

Starfield 09/04
IC 2950

Average Rankings* for Life Expectancy at Ages 40, 65, and 80, for Countries Grouped by Primary Care Orientation

	Age 40		Age 65		Age 80	
	Female	Male	Female	Male	Female	Male
Worse primary care (Belgium, France, Germany, US)	**7.8**	**9.5**	**8.0**	**8.0**	**7.4**	**6.9**
Better primary care (Australia, Canada, Japan, Sweden, Denmark, Finland, Netherlands, Spain, UK**)	**6.7**	**5.9**	**6.6**	**6.6**	**6.8**	**7.1**

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

*England and Wales only

Calculated from: OECD Health Data 1998, Starfield & Shi, Health Policy 2002; 60:201-18

Starfield 09/04
IC 2951

Average Rankings for World Health Organization Health Indicators for Countries Grouped by Primary Care Orientation

	DALEs	Child Survival Equity	Overall Health
Worse primary care (Belgium, France, Germany, US)	**16.3**	**22.5**	**36.3**
Better primary care (Australia, Canada, Sweden, Japan, Denmark, Finland, Netherlands, Spain, UK)	**11.0**	**15.8**	**29.1**

DALE: Disability adjusted life expectancy (life lived in good health)
Child survival: survival to age 2, with a disparities component
Overall health: $\frac{\text{DALE minus DALE in absence of a health system}}{\text{Maximum DALE for health expenditures minus same in absence of a health system}}$

Source: Calculated from WHO World Health Report 2000.

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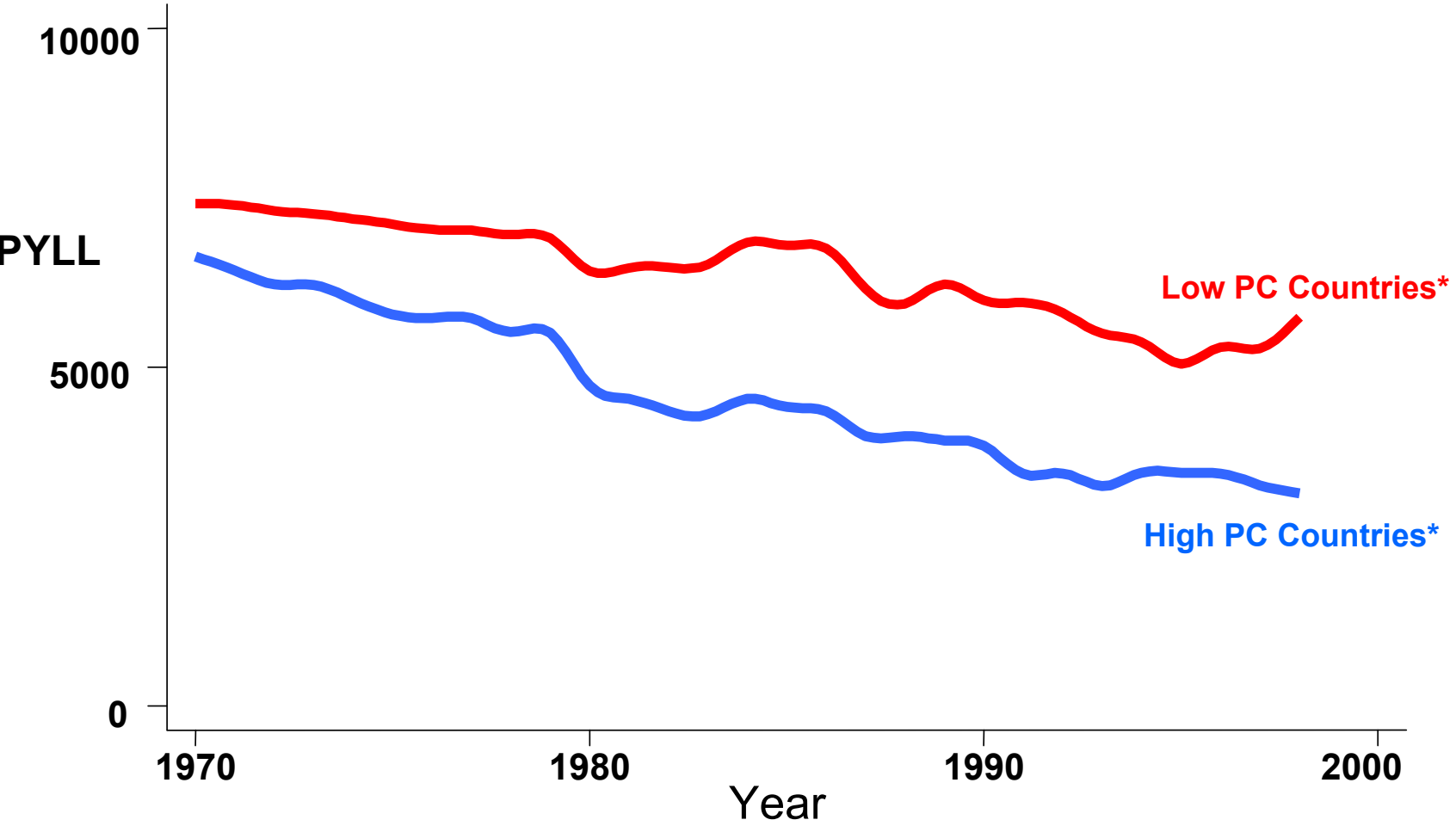
IC 2952

Studies in other developing and middle income countries also show benefit from primary care reform.

- In Bolivia, reform in deprived areas lowered under-5 mortality rates compared with comparison areas.
- In Costa Rica, primary care reforms in the 1990s decreased infant mortality and increased life expectancy to rates comparable to those in industrialized countries.
- In Mexico, improvements in primary care practices reduced child mortality in socially deprived areas.

Sources: Perry et al, Health Policy Plann 1998; 13:140-51; Reyes et al, Health Policy Plann 1997; 12:214-23; Rosero-Bixby, Rev Panam Salud Publica 2004; 15:94-103; Rosero-Bixby, Soc Sci Med 2004; 58:1271-84

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 or GDP, percent elderly, doctors/capita, average income (ppp), alcohol and tobacco use. R^2(within)=0.77.

Source: Macinko et al. Health Serv Res 2003; 38:831-65

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IC 2953

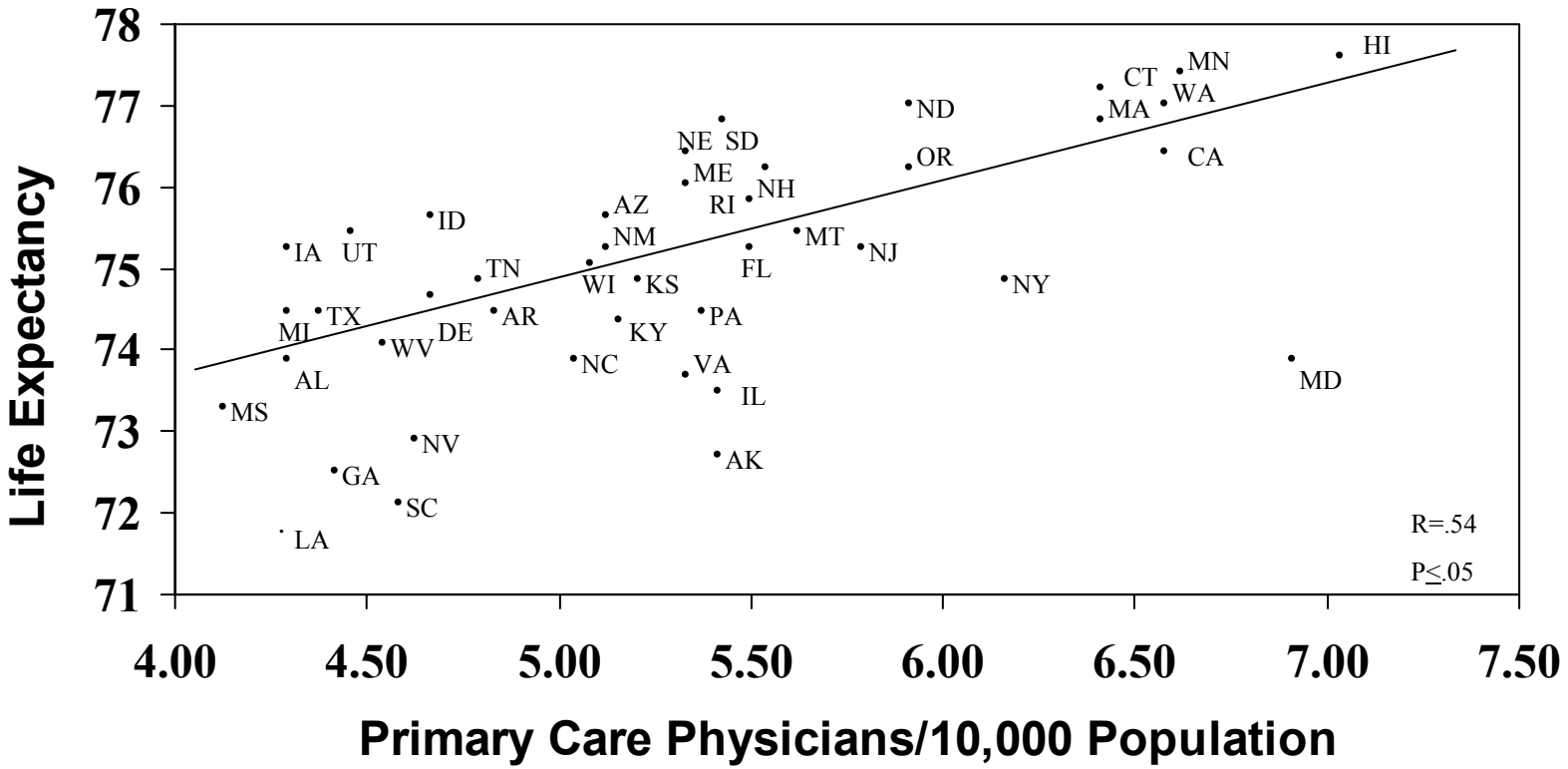
Overall, countries that achieve better health levels

- Are primary care-oriented
- Have more equitable resource distributions
- Have government-provided health services or health insurance
- Have little or no private health insurance
- Have no or low co-payments for health services

Sources: Starfield and Shi, Health Policy 2002; 60:201-18.
an Doorslaer et al. Health Econ 2004; 13:629-47

Is Primary Care as Important within Countries as It Is among Countries?

State Level Analysis: Primary Care and Life Expectancy



Source: Shi et al. J Fam Pract 1999; 48:275-84

Starfield 09/02
WC 2186

In both England and the US, each additional primary care physician per 10,000 population (a 12-20% increase) is associated with a decrease in mortality of 3-10%, depending on the cause of death. This is true even after adjusting for sociodemographic and socioeconomic characteristics.

Source: Gulliford, J Public Health Med 2002; 24:252-4,
and personal communication 9/04

Regression Analysis: Characteristics of Medicare Beneficiaries in Fair or Poor Health with a Preventable Hospitalization*

Characteristics	Odds Ratio (95% confidence interval)
Male	1.31 (1.03-1.68)
Primary care shortage area	1.70 (1.09-2.65)

*Only significant ($p<.05$) shown. Nonsignificant: age, nonwhite, education, marital status, income, supplemental insurance.

Source: Parchman & Culler, Arch Fam Med 1999; 8:487-91

Health Care Expenditures and Mortality 5 Year Followup: United States, 1987-92

- Adults (age 25 and older) with a primary care physician rather than a specialist as their personal physician
  - had 33% lower cost of care
  - were 19% less likely to die (after controlling for age, gender, income, insurance, smoking, perceived health (SF-36) and 11 major health conditions)

Source: Franks & Fiscella, J Fam Pract 1998; 47:105-9

Starfield 05/99
WC 1504

Primary Care and Infant Mortality Rates, Indonesia, 1996-2000

	1996-1997	1997-1998	1998-1999	1999-2000
Primary care spending per capita*	10.3	9.6	8.5	8.2
Hospital spending per capita*	4.1	4.4	4.6	5.3
Infant mortality	20% improvement (all provinces) (1990-96)			14% worsening (22 of 26 provinces)

constant Indonesian rupiah, in billions

Source: Simms & Rowson, Lancet 2003; 361:1382-5

Starfield 05/03
WC 2499

Primary Care Score and Self-Rated Health, Petrópolis, Brazil, 2004*

(n=455)	Odds Ratio	95% CI**
Primary care score (0-5)	1.452	1.073, 1.966
Age (years)	0.969	0.957, 0.981
Chronic disease (yes/no)	0.578	0.360, 0.927
Recent illness (yes/no)	0.176	0.098, 0.316
Household wealth (scale 1-8)	1.219	1.007, 1.476
Completed primary school	0.733	0.374, 1.437
Clinic type (0=traditional; 1=PSF)	0.998	0.594, 1.679

1= excellent/ good health; 0=bad/fair/poor health
* standard errors adjusted for clustering by clinic

Source: Macinko et al, submitted 2005

Starfield 06/04
WC 2896

Association between High Satisfaction with Practitioner at the Most Recent Visit, Porto Alegre, 2002

Variables	**Odds Ratio (IC 95%)***
Child hospitalized in past year	0.54 (0.31 – 0.96)
Mother works outside the home	1.50 (1.02 – 2.20)
Practitioner works in primary care setting	2.11 (1.30 – 3.41)
High primary score of practice	**5.13 (3.08 – 8.56)**

* Logistic regression

Source: Harzheim E, 2004.

Many other studies done WITHIN countries, both industrial 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.

Source: Starfield B. www.pitt.edu/~super1/lecture/lec8841/index.htm

Primary Care and Specialty Care

Major Determinants of Outcomes*: 50 US States

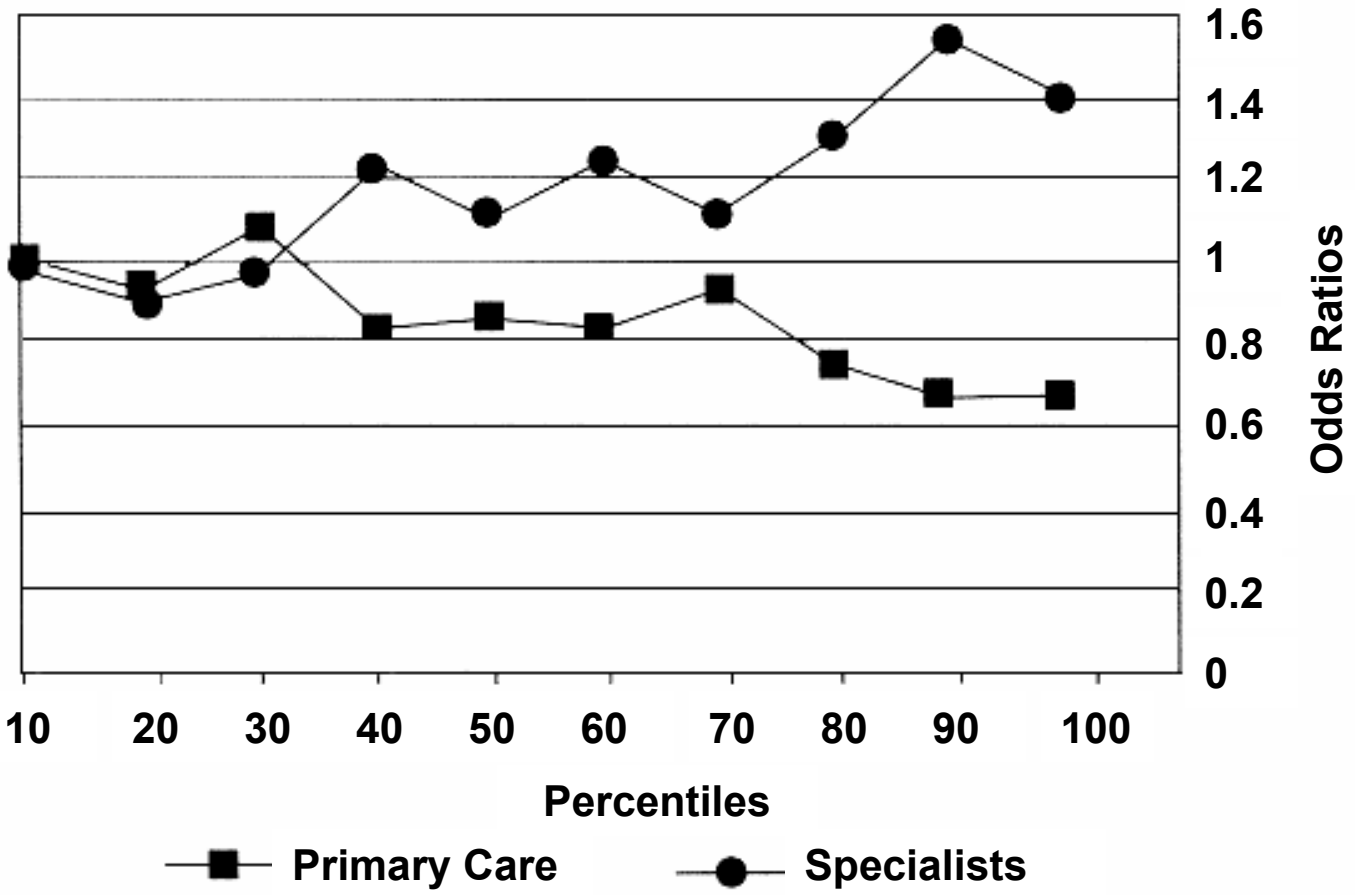
Specialty physicians:	More: all outcomes worse
Primary care physicians:	Fewer: all outcomes worse
Hospital beds:	More: higher total, heart disease, and neonatal mortality
Education:	No relationship
Income:	Lower: higher heart and cancer mortality
Unemployment:	Higher: higher total mortality, lower life span, more low birth weight
Urban:	Lower mortality (all), longer life span
Pollution:	Higher total mortality
Life style:	Worse: higher total and cancer mortality, lower life span
Minority:	Higher total mortality, neonatal mortality, low birth weight, lower life span

Note: All variables are ecologic, not individual.
*Overall mortality; mortality from heart disease, mortality from cancer, neonatal mortality, life span, low birth weight.

Source: Shi, Int J Health Serv 1994; 24:431-58

Starfield 1997
IH 1067

The Regional Primary Care and Specialty Physician Supply and Odds of Late-stage Diagnosis of Colorectal Cancer



Source: Roetzheim et al. J Fam Pract 1999; 48:850-8

Starfield 08/02
WC 2179

Early detection of breast cancer is greater when the supply of primary care physicians is higher. Each tenth percentile increase in primary care physician supply is associated with a statistically significant 4% increase in the likelihood of EARLY (rather than late) stage diagnosis.

Source: Ferrante et al. J Am Board Fam Pract 2000; 13:408-14

Starfield 09/04
WC 2960

For cervical cancer, rates of incidence of advanced stage presentation are lower in areas that are well-supplied with family physicians, but there is no advantage of having a greater supply of specialist physicians, either in total or for obstetrician/gynecologists.

Source: Campbell et al. Fam Med 2003; 35:60-4

Melanoma is identified at an earlier stage in areas where the supply of family physicians is high, both in urban areas and non-urban areas. The same is the case for dermatologists, but the relationship is not statistically significant, and there is no relationship of early detection with the supply of other specialists.

Source: Roetzheim et al. J Am Acad Dermatol 2000; 43:211-8

What We Already Know

A primary care oriented system is important for

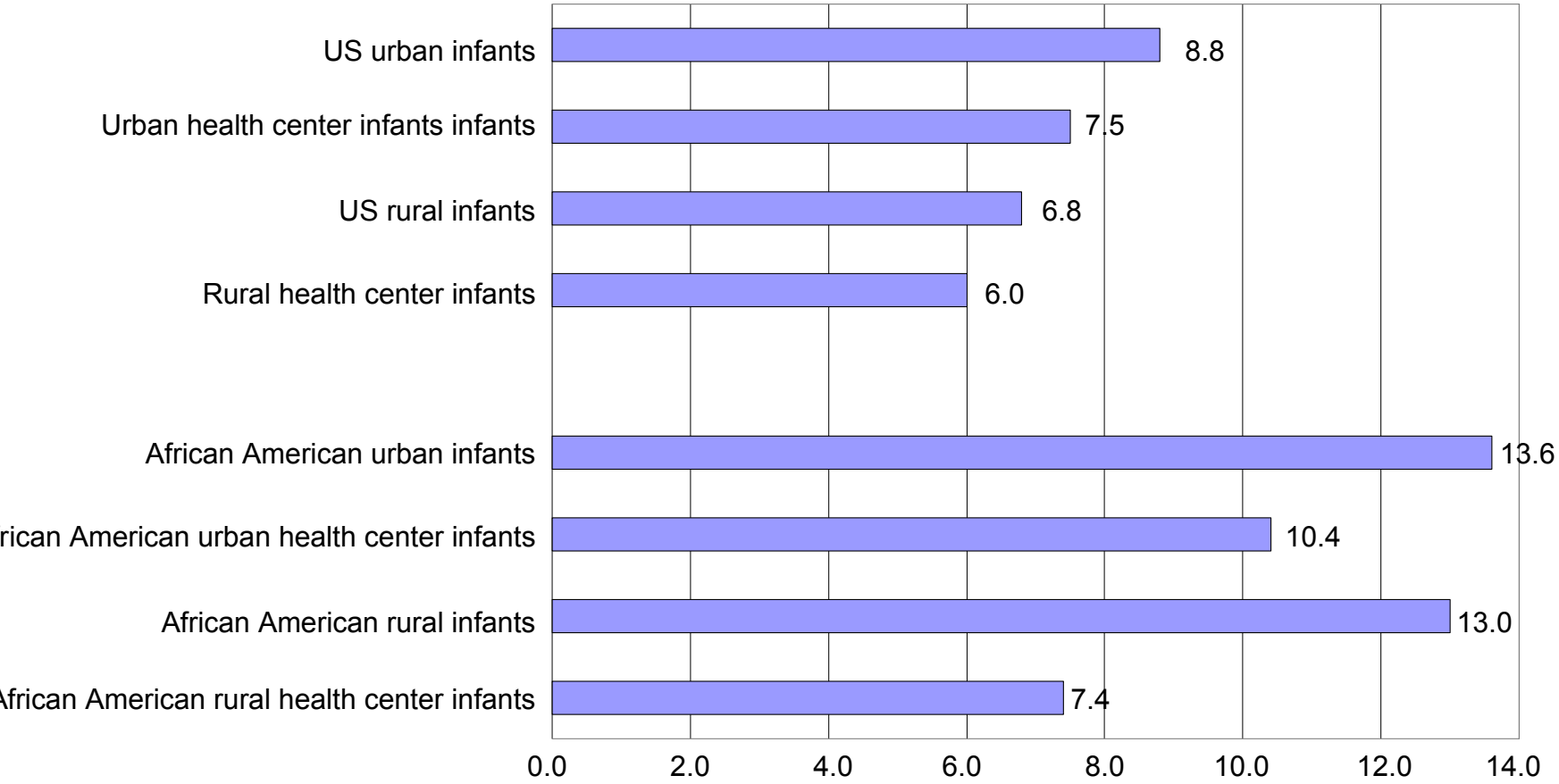
- Improving health (improving effectiveness)
- Keeping costs manageable (improving efficiency)
- Increasing supply of specialists is not generally associated with improved population health

Does primary care reduce inequity in health?

Equity in health is the absence of systematic and potentially remediable differences in one or more aspects of health across population groups defined geographically, demographically, or socially.

Source: www.isegh.org

Low Birth Weight among US Rural, Urban, and Primary Care Health Center Infants



Source: Politzer et al. Med Care Res Rev 2001; 58:234-48

Starfield 10/03
WC 2637

Reductions* in Inequality in Health by Primary Care: Postneonatal Mortality, 50 US States, 1990

Areas with low income inequality (mostly homogeneous high income areas)

High primary care resources	0.8% decrease in mortality
Low primary care resources	1.9% increase in mortality

Areas with high income inequality

High primary care resources	17.1% decrease in mortality
Low primary care resources	6.9% increase in mortality

compared with population mean

Based on data in Shi et al. J Fam Pract 1999; 48:275-84

Starfield 05/05
EQ 3215

Reductions* in Inequality in Health by Primary Care: Stroke Mortality, 50 US States, 1990

Areas with low income inequality (mostly homogeneous high income areas)

High primary care resources	1.3% decrease in mortality
Low primary care resources	2.3% increase in mortality

Areas with high income inequality

High primary care resources	2.3% decrease in mortality
Low primary care resources	1.1% increase in mortality

compared with population mean

Based on data in Shi et al. J Fam Pract 1999; 48:275-84

Starfield 05/05
EQ 3213

Reductions in Inequality in Health by Primary Care: Self-Reported Health, 60 US Communities, 1996

Percent reporting fair or poor health

- **Areas with low income inequality** (mostly homogeneous high income areas)
  - No effect of primary care resources*
- **Areas with moderate income inequality**
  - 16% increase in areas with low primary care resources*
- **Areas with high income inequality**
  - 33% increase in areas with low primary care resources*

compared with median # of primary care physicians to population ratios

Based on data in Shi & Starfield, Int J Health Serv 2000; 30:541-55

Overall, 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.

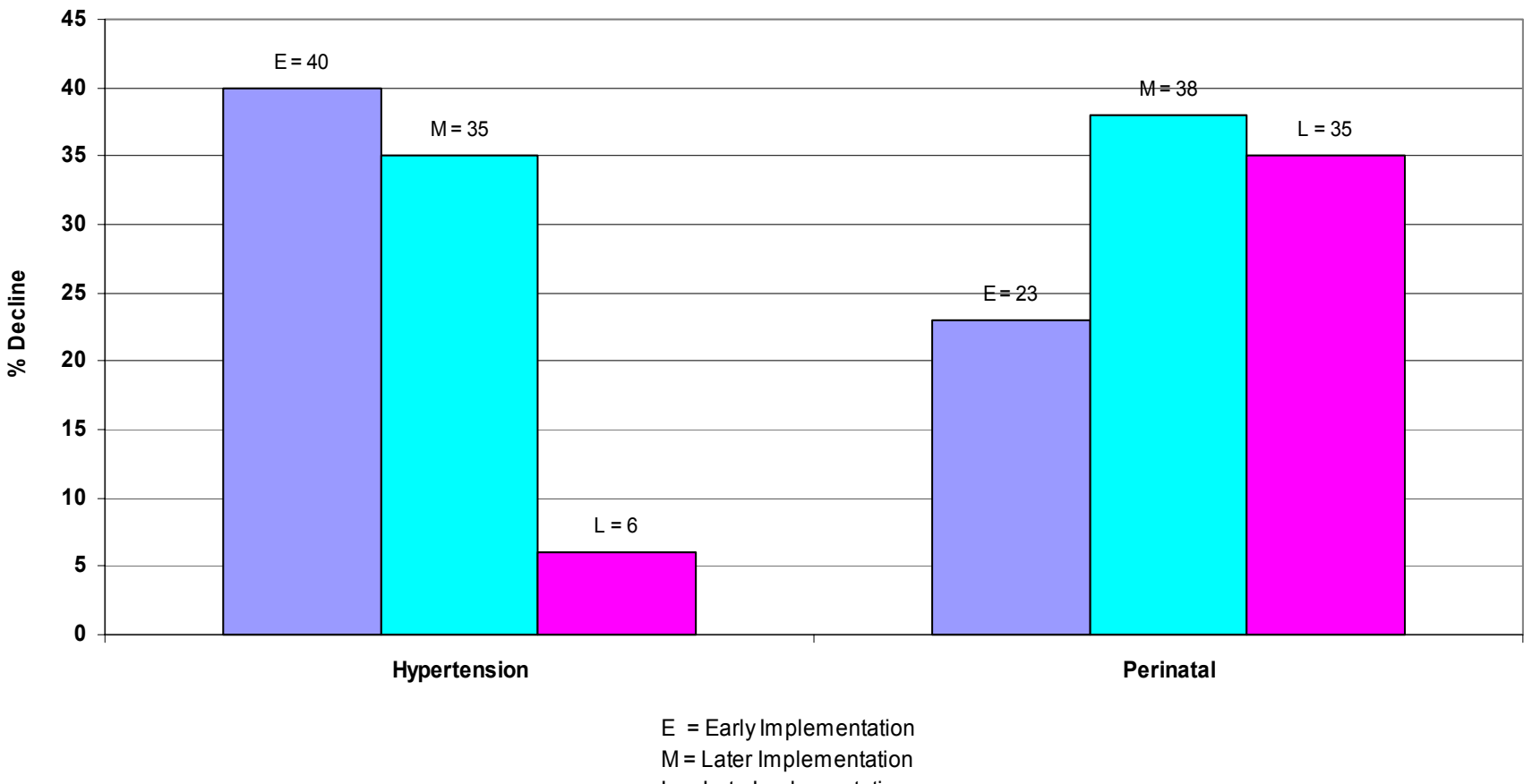
Source: Shi et al. Soc Sci Med 2005; 61(1):65-75.

Primary care physician supply is consistently associated with improved health outcomes (all-cause, cancer, heart disease, stroke, infant mortality, low birth weight, life expectancy, self-rated health).

A 12% increase in such physicians (1 per 10,000) improves outcomes an average of 4% (range 1.3-10.8% depending on particular outcome and geographic unit of analysis).

Source: Macinko et al. mss 2005

Primary Care Reform, 1984-90 to 1994-96, Percent Decline in Mortality - Various Causes, Barcelona, Spain



Source: Villalbi et al. Aten Primaria 1999; 24:468-74.

Starfield 11/00
WC 1800

Does Primary Care Reduce Inequity in Health in Developing Countries?

So far, the evidence for the benefits of primary care has come from industrialized countries. What about developing countries? Although there have been very few studies of this subject in developing countries, the conclusion is the same: better primary health care, more equity in health services and health outcomes.

In 7 African countries

- The highest 1/5 of the population receives well over twice as much financial benefit from overall government health spending (30% vs 12%).
- For primary care, the poor/rich benefit ratio is much lower (23% vs 15%).

"From an equity perspective, the move toward primary care represents a clear step in the right direction."

Source: Gwatkin, Int J Epidemiol 2001; 30:720-3, based on Castro-Leal et al, Bull World Health Organ 2000; 78:66-74

Share of Public Spending on Health among Countries with Similar GNP per Capita But Very Disparate Child Survival (to Age 5) Rates, 1995

Ratio*: percent of expenditures for health from the government to poorest 20% vs. richest 20% of population				
High child survival		Low child survival		Additional children lost per 1000
Sri Lanka	1.1	Ivory Coast	0.3	150
Malaysia	2.6	Brazil	0.4	45
Costa Rica	2.1	South Africa	0.9	55
Jamaica	3.3	Ecuador	0.2	25
Nicaragua	1.0	India	0.3	50
Egypt	0.6	Ivory Coast	0.3	100

Ratios of one or more signify a greater share of government expenditures
o poorest segment of population.

Sources: Calculated from Karolinska Institute, Global health chart, www.whc.ki.se/index.php.
Victora et al, Lancet 2003; 362:233-241. Castro-Leal et al, Bull World Health Organ 2000; 78:66-
4. Carr, Improving the Health of the World's Poorest People, Population Health Bureau, 2004

Starfield 04/04
IC 2854

Primary Care and Health: Evidence-Based Summary

- Countries with strong primary care
  - have lower overall costs
  - generally have healthier populations
- Within countries
  - areas with higher primary care physician availability (but NOT specialist availability) have healthier populations
  - more primary care physician availability reduces the adverse effects of social inequality

Conclusion (1)

Virchow said that medicine is a social science and politics is medicine on a grand scale.

Along with improved social and environmental conditions as a result of public health and social policies, primary care is an important aspect of policy to achieve effectiveness, efficacy, and equity in health services.

Conclusion (2)

Although socioeconomic factors undoubtedly influence health, health services are a highly policy-relevant influence because their effect is clear and relatively rapid, particularly concerning prevention of the progression of illness and effects of injury, especially at younger ages.