

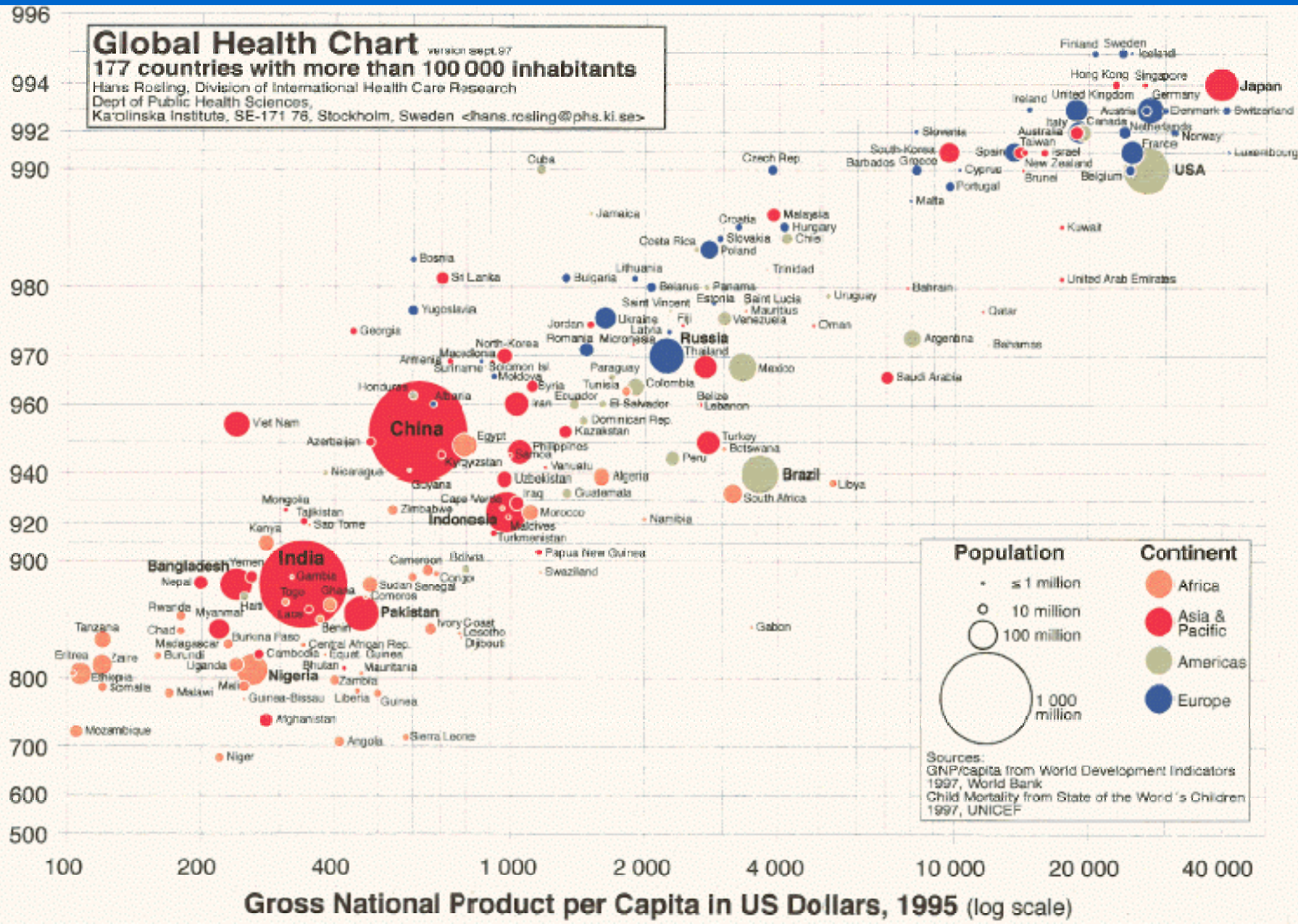
Primary Care in the Context of Health Services Systems

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Children surviving up to 5 years of age per 1000 live births, 1995
 ("Under-five mortality rate" on log scale expressed as "survival rate")

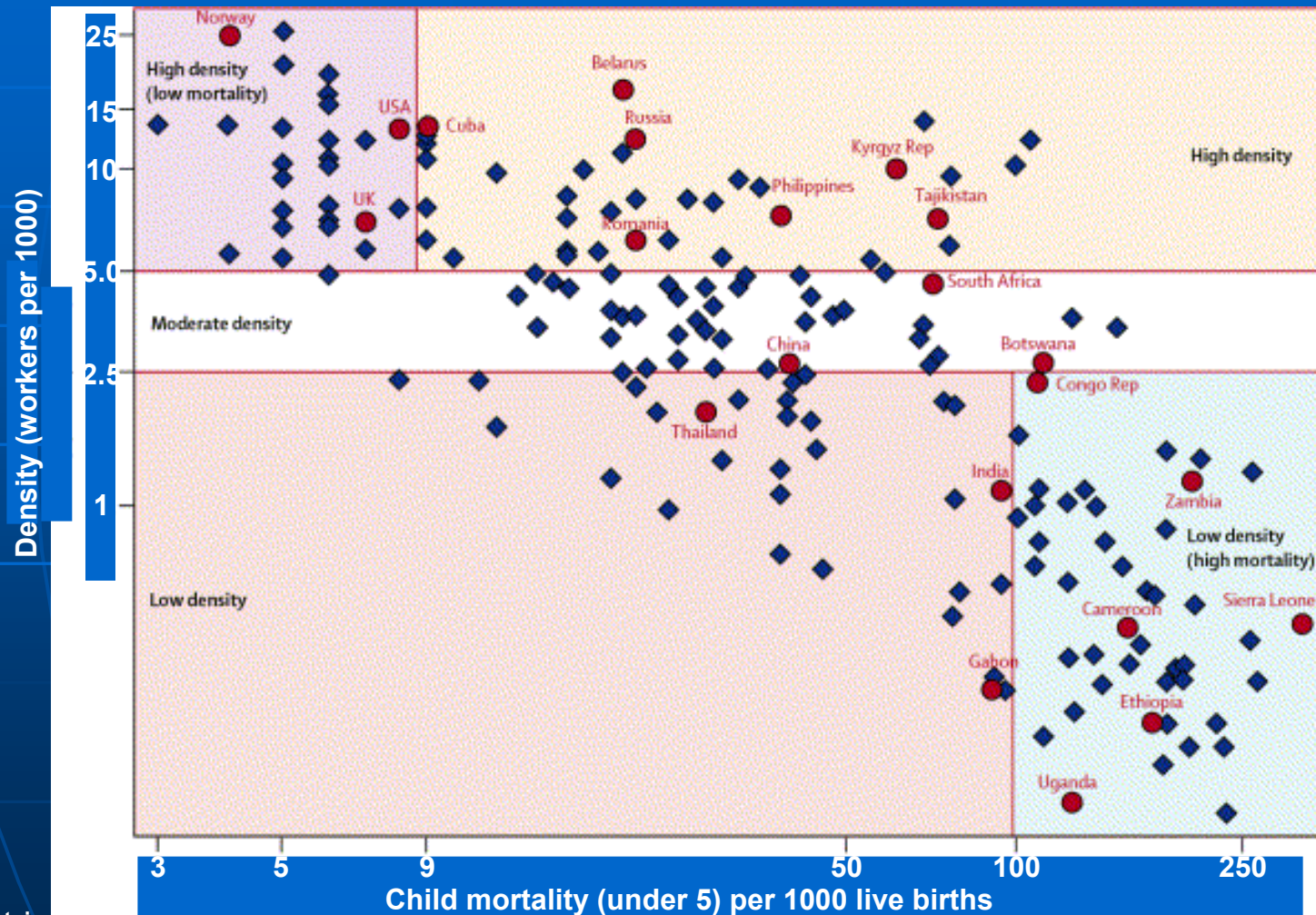
Global Health Chart version sept.97
 177 countries with more than 100 000 inhabitants
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 Dept of Public Health Sciences,
 Karolinska Institute, SE-171 76, Stockholm, Sweden <hans.rosling@phs.ki.se>



Population		Continent	
•	≤ 1 million	○	Africa
○	10 million	●	Asia & Pacific
○	100 million	●	Americas
○	1 000 million	●	Europe

Sources:
 GNP/capita from World Development Indicators 1997, World Bank
 Child Mortality from State of the World's Children 1997, UNICEF

Country* Clusters: Health Professional Supply and Child Survival



*186 countries

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

Starfield 12/04
HS 3083

Health systems have several major components:

- Public health activities
- Primary care
- Specialty care

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.

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.

Why Is Primary Care Important?

Better health outcomes

Lower costs

Greater equity in health

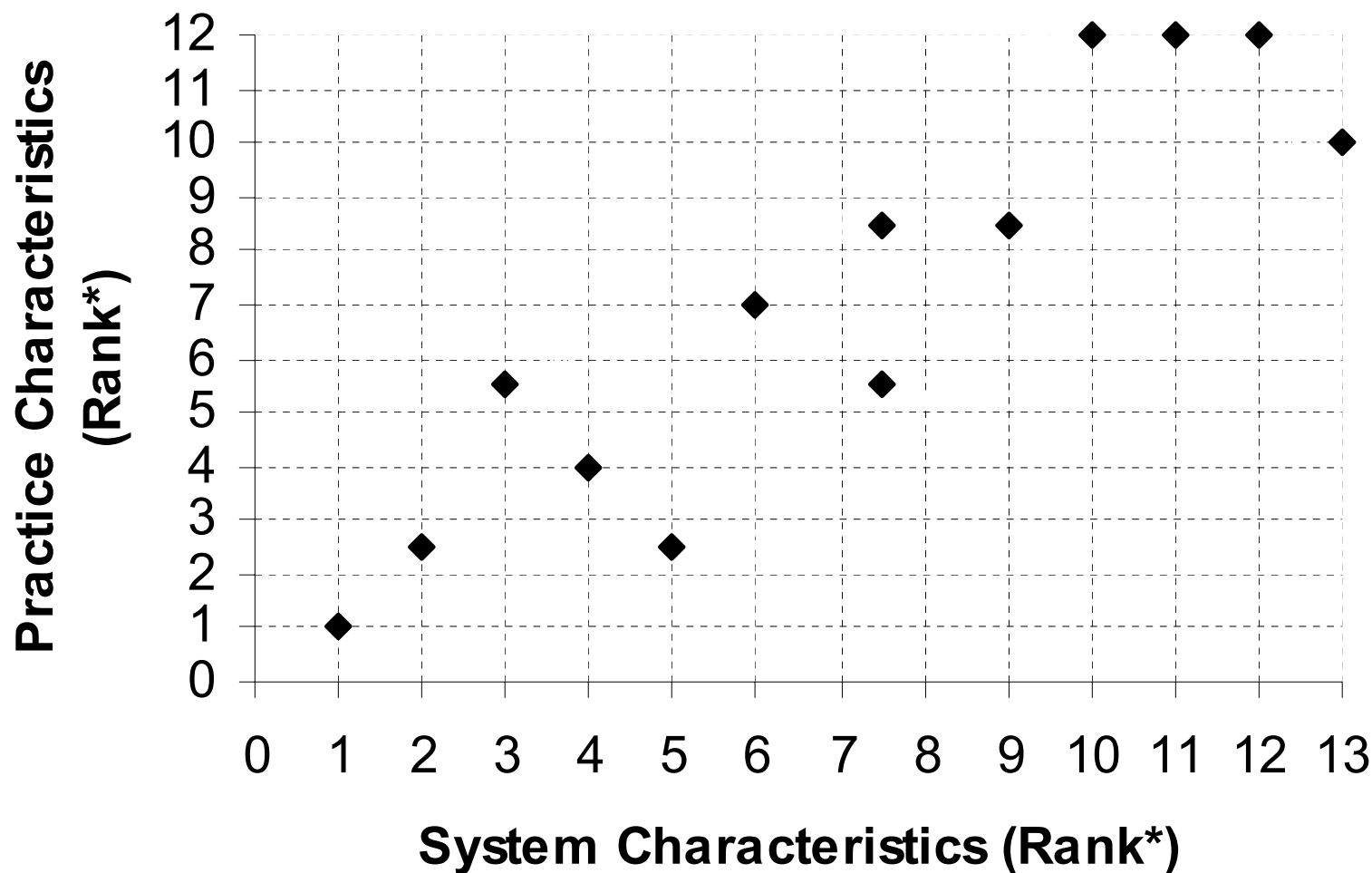
Evidence of the Benefits of a Primary Care-Oriented Health System

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

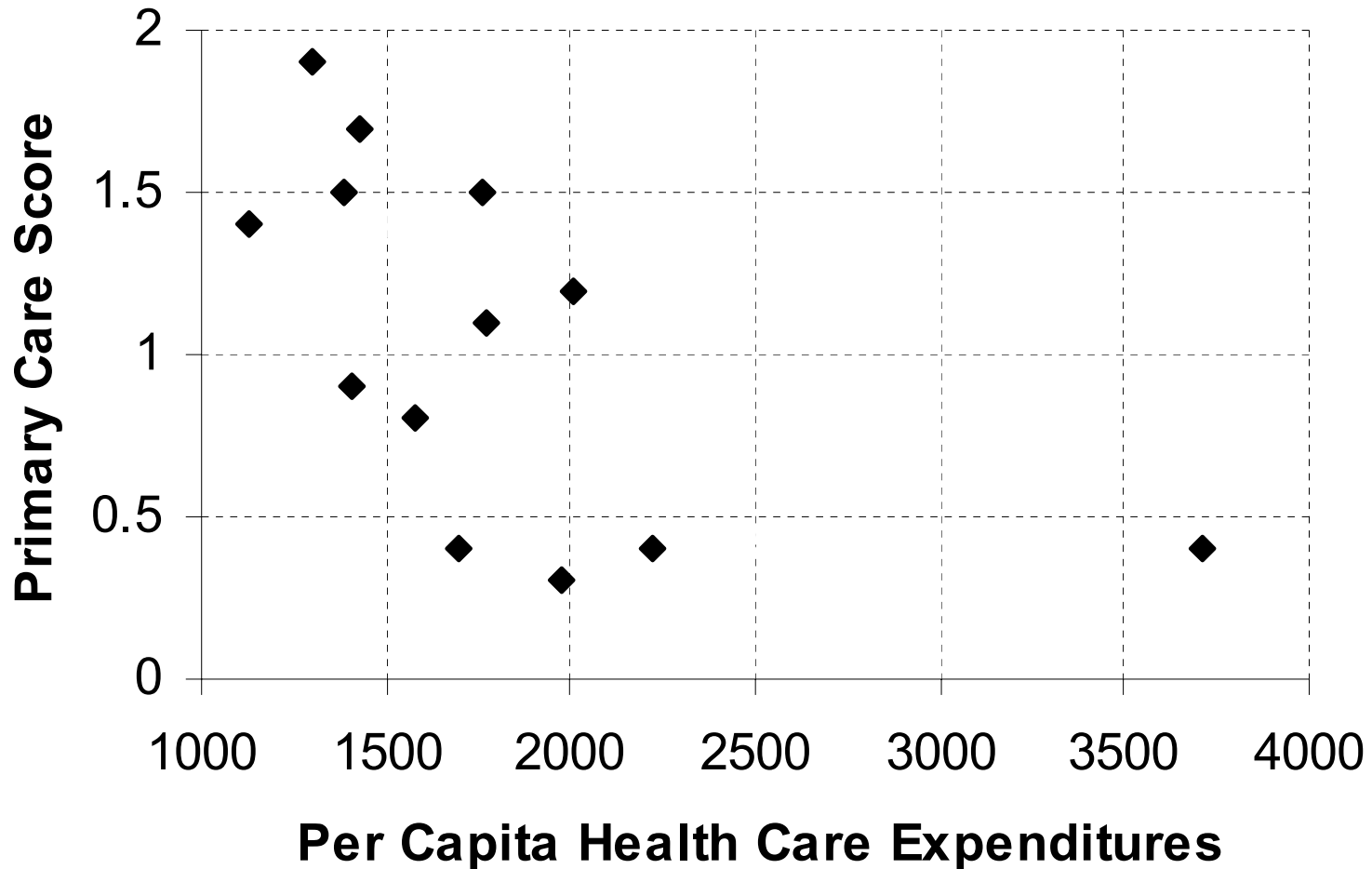
System (PHC) and Practice (PC) Characteristics Facilitating Primary Care, Early-Mid 1990s



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

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

Primary Care Score vs. Health Care Expenditures, 1997



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

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; thus, lower average ranks indicate better performance.

**England and Wales only

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; thus, lower average ranks indicate better performance.

**England and Wales only

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: $\frac{\text{DALE} - \text{DALE in absence of a health system}}{\text{Maximum DALE for health expenditures} - \text{same in absence of a health system}}$

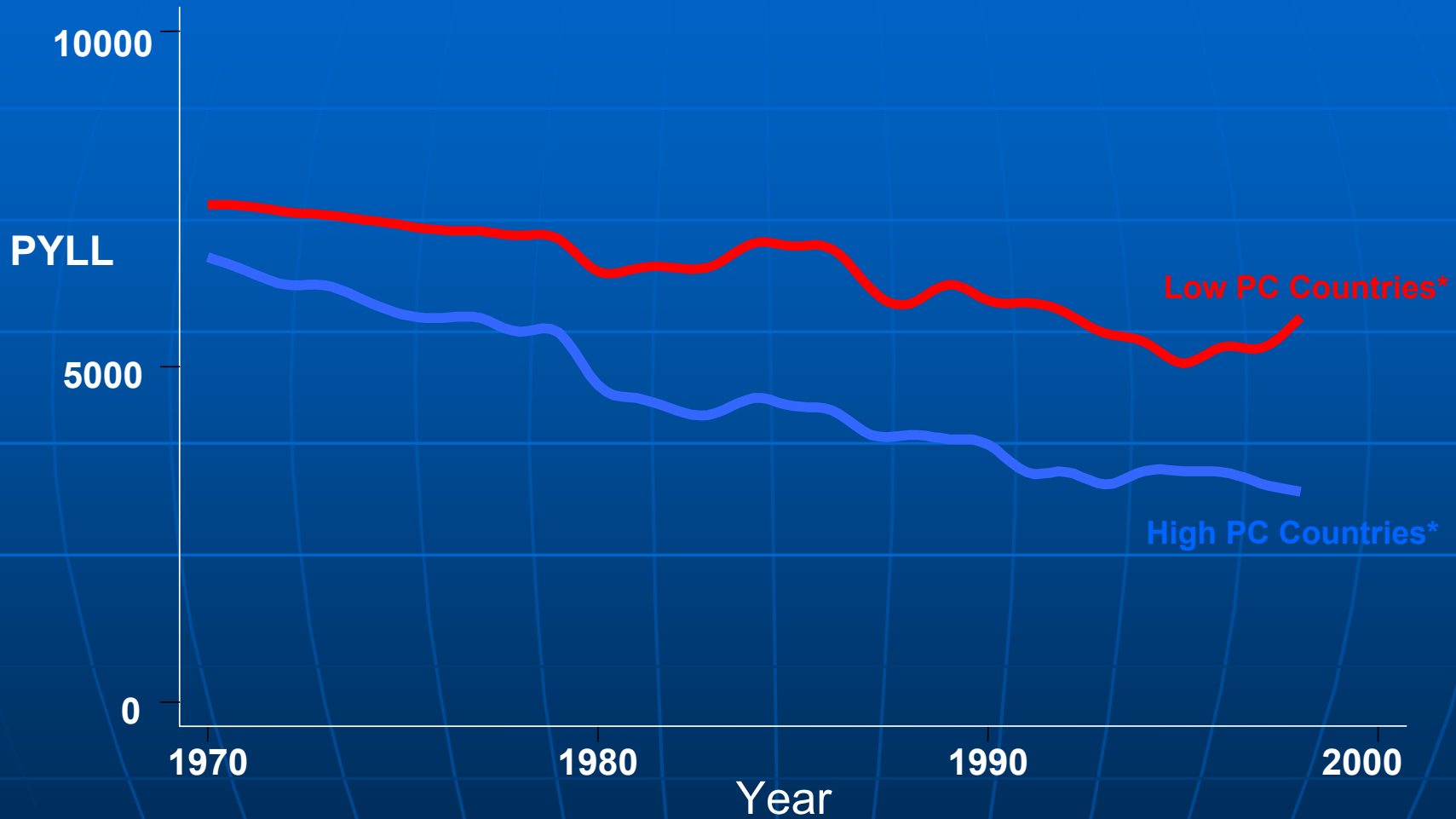
Source: Calculated from WHO, World Health Report 2000.

Primary Care Score and Health Outcomes

Health Outcome	Association with Primary Care Score*	
	In Males	In Females
All-cause mortality	√	
Life expectancy	√	
Infant Mortality Rate	√	
PYLL (all causes)	√	√
PYLL (pneumonia & influenza)	√	√
PYLL (asthma & bronchitis)	√	√
PYLL (cerebrovascular disease)	√	√
PYLL (heart disease)	√	√

*Primary care coefficient significant at $p < 0.05$ level and 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. $R^2(\text{within})$ averaged from to .36 to .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 for GDP, percent elderly, doctors/capita, average income (ppp), alcohol and tobacco use. $R^2(\text{within})=0.77$.

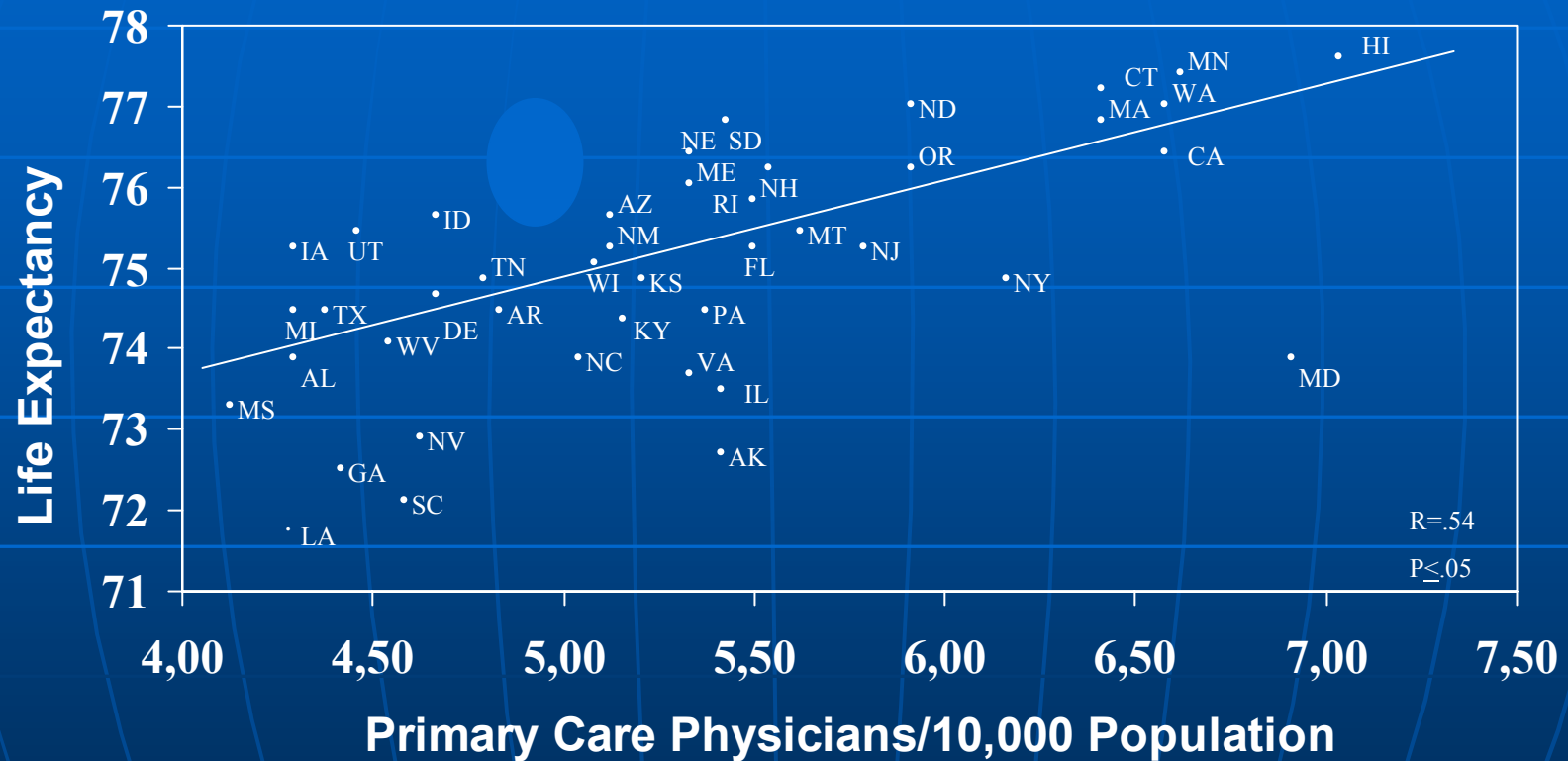
Source: Macinko et al, Health Serv Res 2003; 38:831-65.

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

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

State Level Analysis: Primary Care and Life Expectancy



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.

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

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.

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.

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.

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)

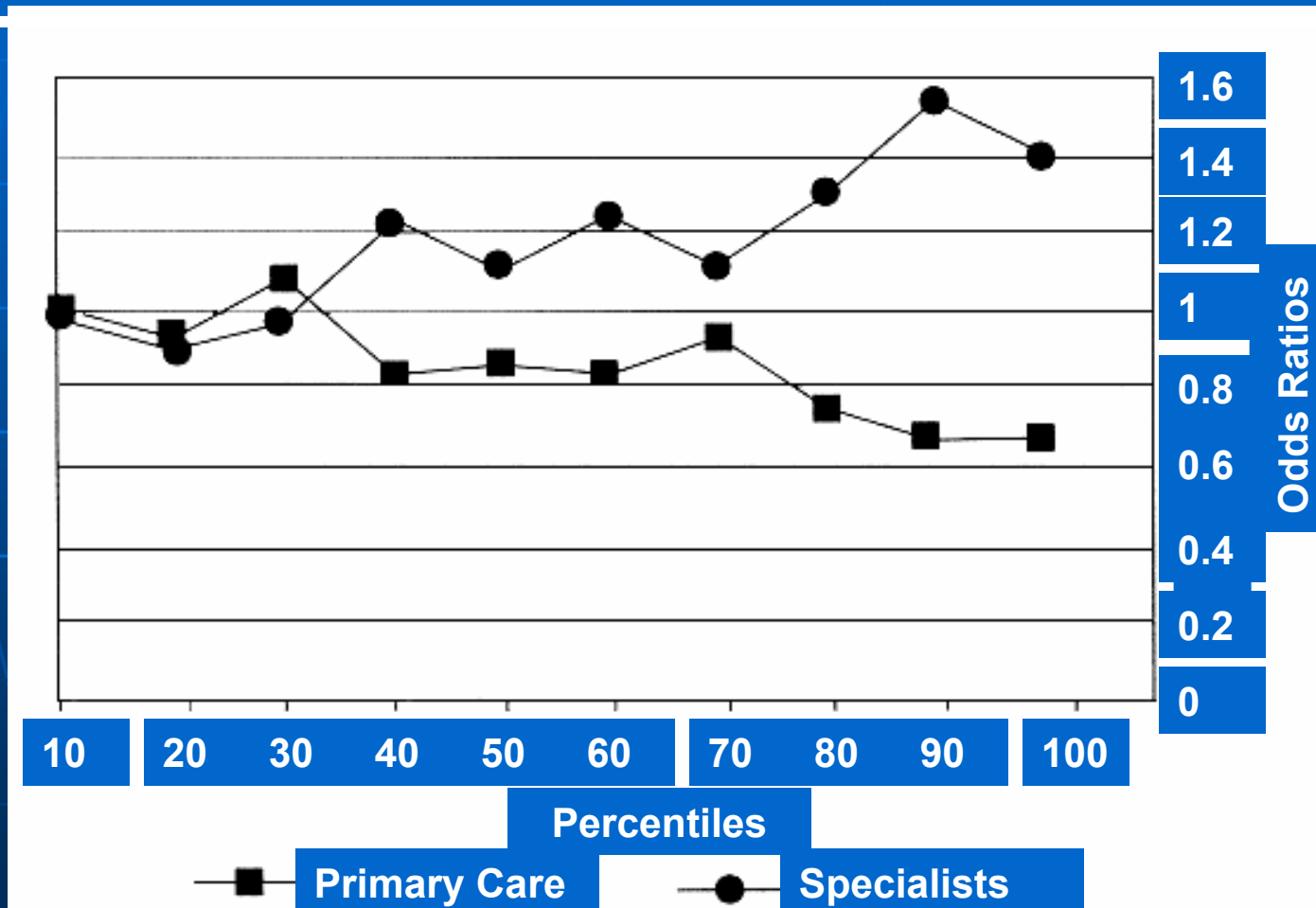
Major Determinants of Outcomes*: 50 US States

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.

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



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.

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.

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.

What We Already Know

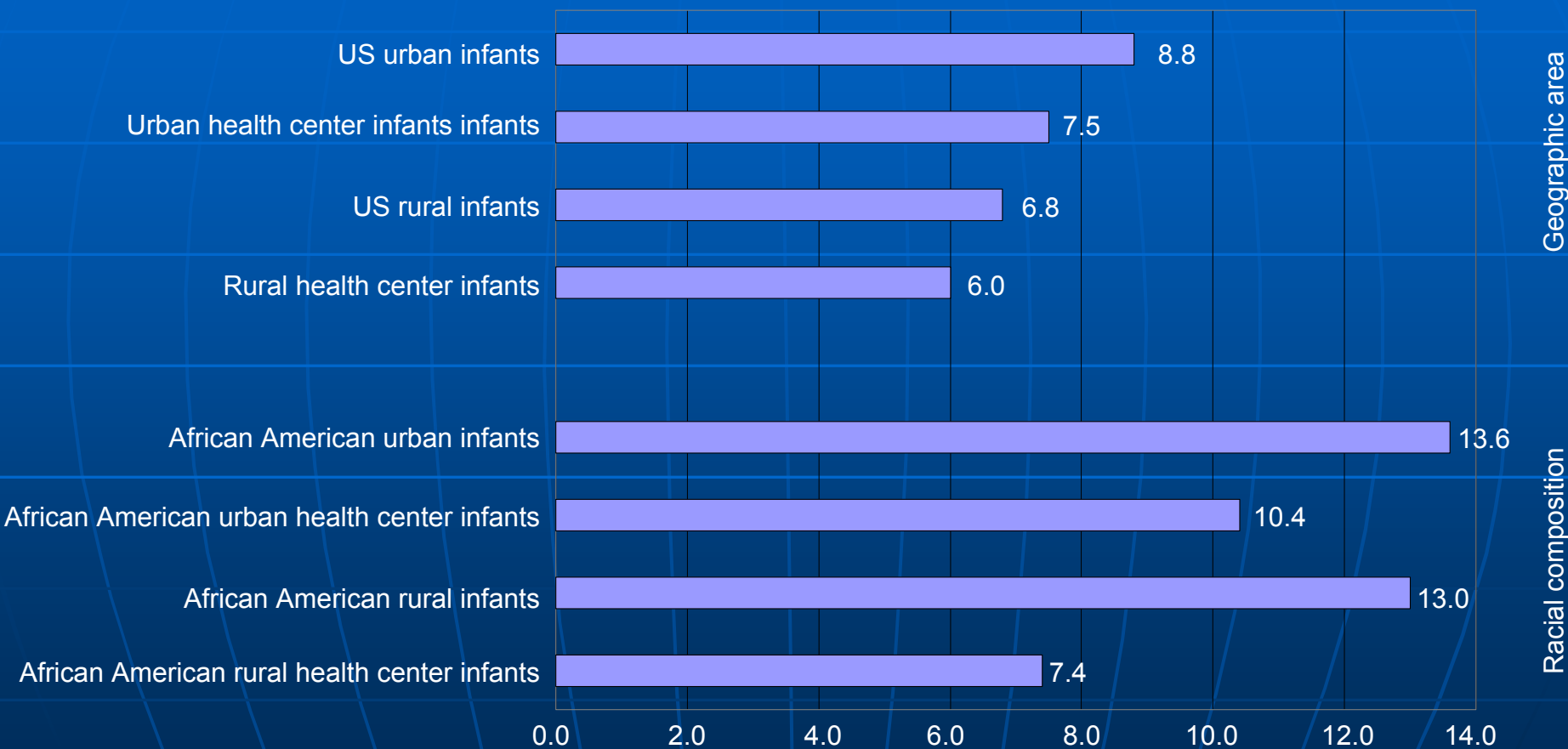
A primary care oriented system is important for

- Improving health (improving effectiveness)
- Keeping costs manageable (improving efficiency)

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.

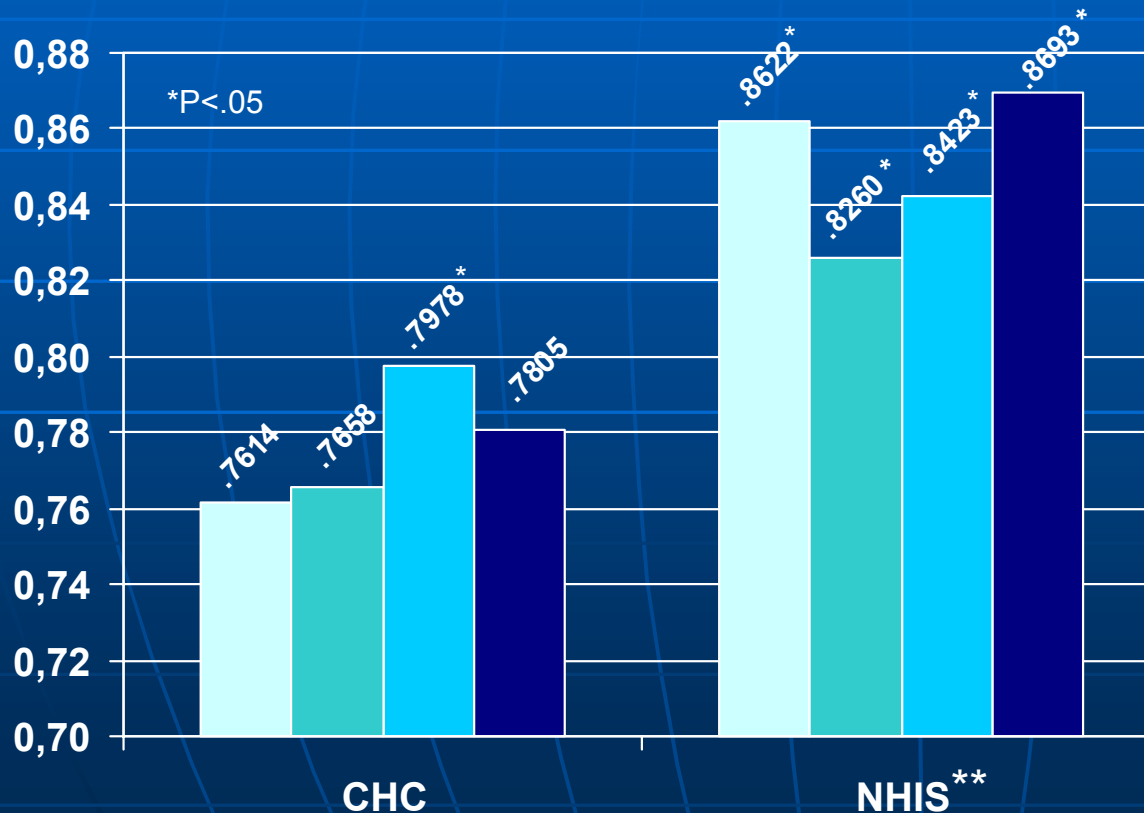
Low Birth Weight among US Rural, Urban, and Primary Care Health Center Infants



Association of Primary Care with Reduced Racial Disparities in Healthy Life

Fraction of Healthy Life

■ White ■ Black ■ Hispanic ■ Other



Health Center patients experience lower levels of healthy life across all racial/ethnic groups.

Significant racial/ethnic disparities exist in the nation's low-income individuals.

Health Center Hispanic patients experience greater healthy life, no Black/White differences.

**people under poverty level with at least one doctor visit

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
Low primary care resources

0.8% decrease in mortality
1.9% increase in mortality

Areas with high income inequality

High primary care resources
Low primary care resources

17.1% decrease in mortality
6.9% increase in mortality

*compared with population mean

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

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

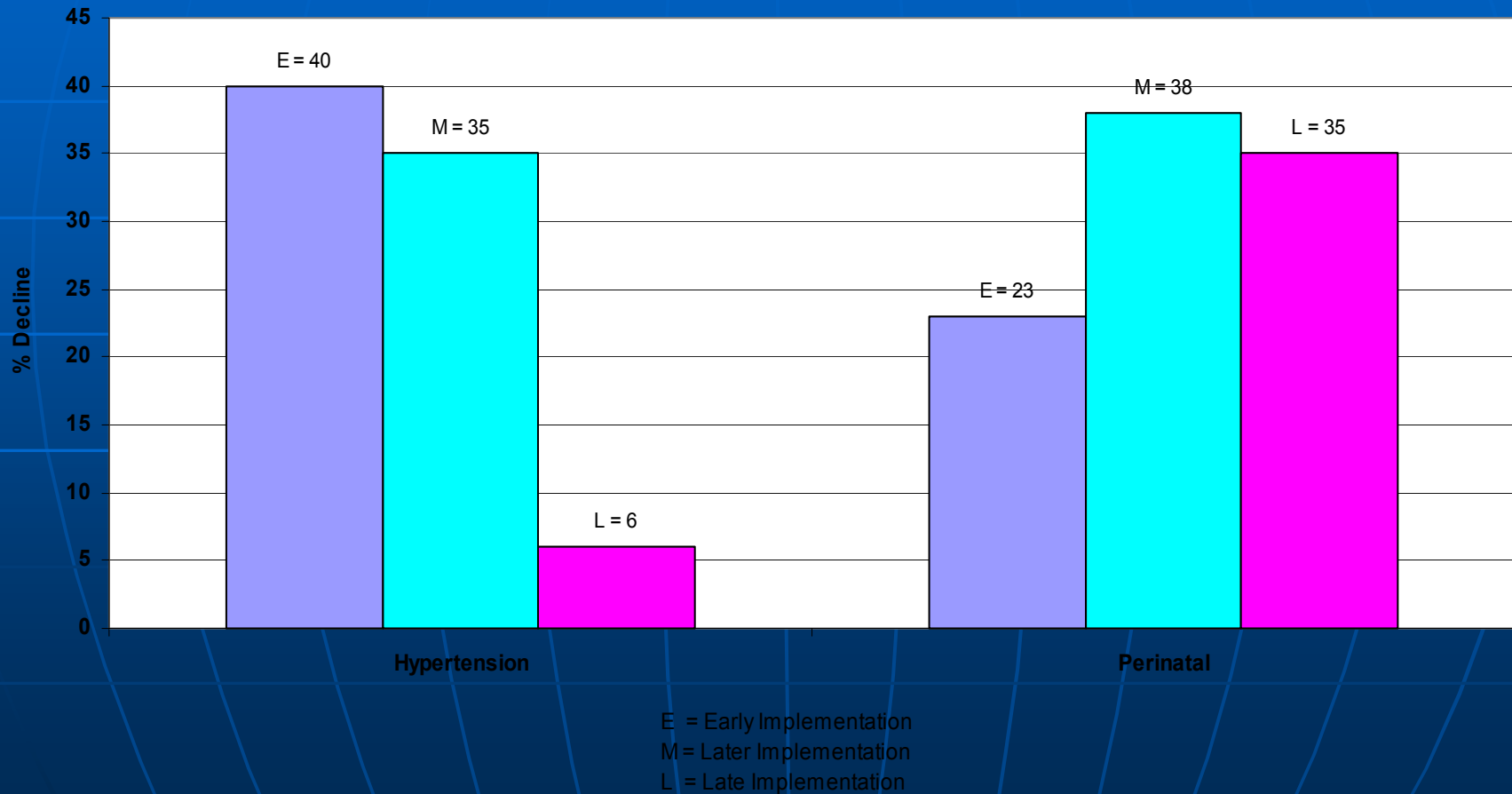
Overall, in the United States, an increase of 1 primary care doctor is associated with 1.44 fewer deaths per 10,000 population.

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

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).

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



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, primary care represents a clear step in the right direction.”

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 to 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; 78:66-74. Carr. Improving the Health of the World's Poorest People. Population Health Bureau, 2004.

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.