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Structure, Process, and Outcome in Health System Improvement

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Avedis Donabedian Award
in Quality Improvement Session
(Washington, DC, 2007)

Revolutions in Medicine, 1900s

Ascendance of single disease and chronic illness focus

Diagnostic challenges/more technology

Single cause (? gene) – magic bullet

All fostered an **INDIVIDUAL ORIENTATION** in health services.

Revolutions in Medicine, 2000s

Multiple interacting influences on illness/
health

Disparities in health (inequity)

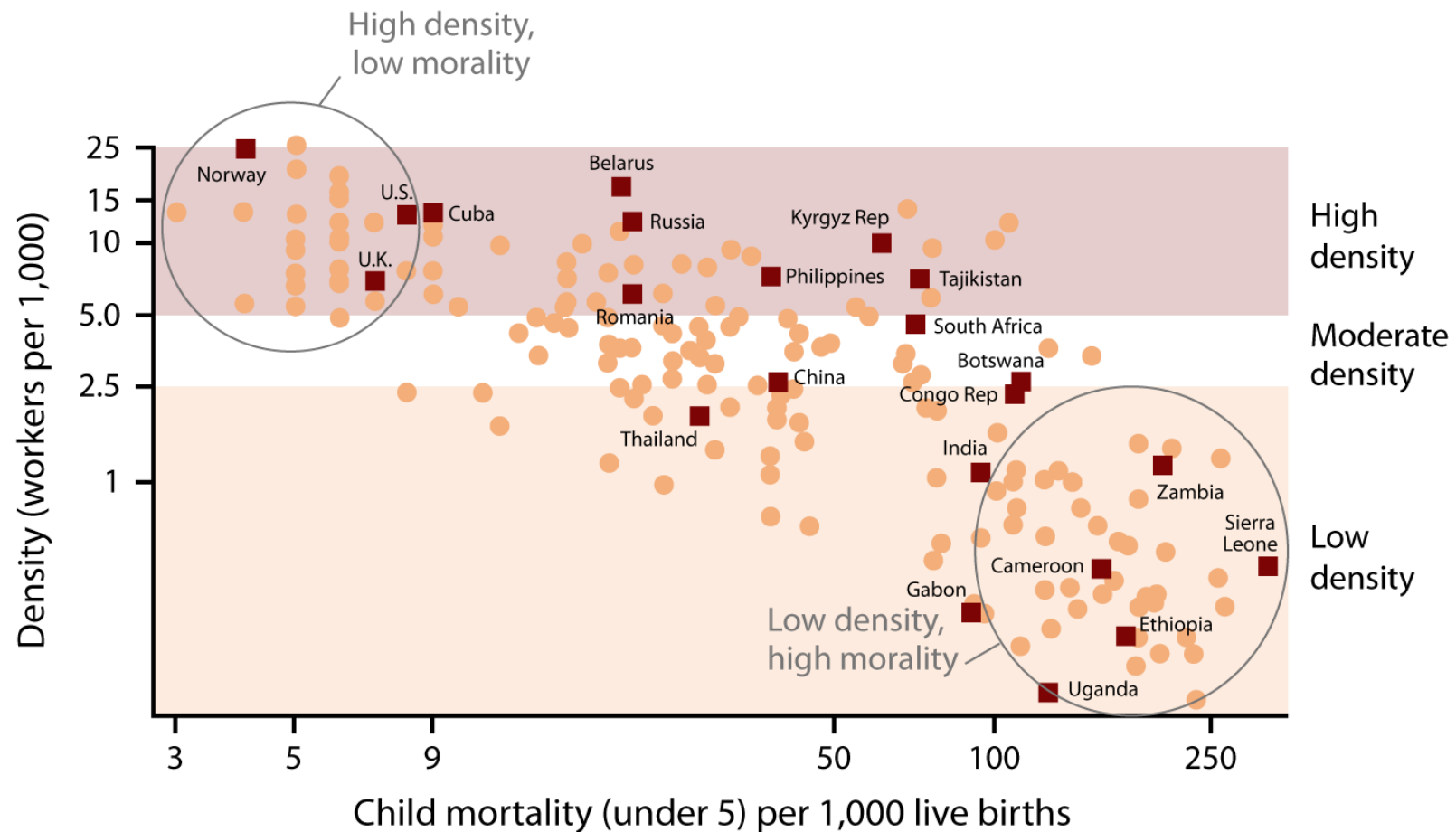
Illness as morbidity burden, not as disease

Risk factors as diseases

Health as an impossibility (a healthy person
is someone without enough tests)

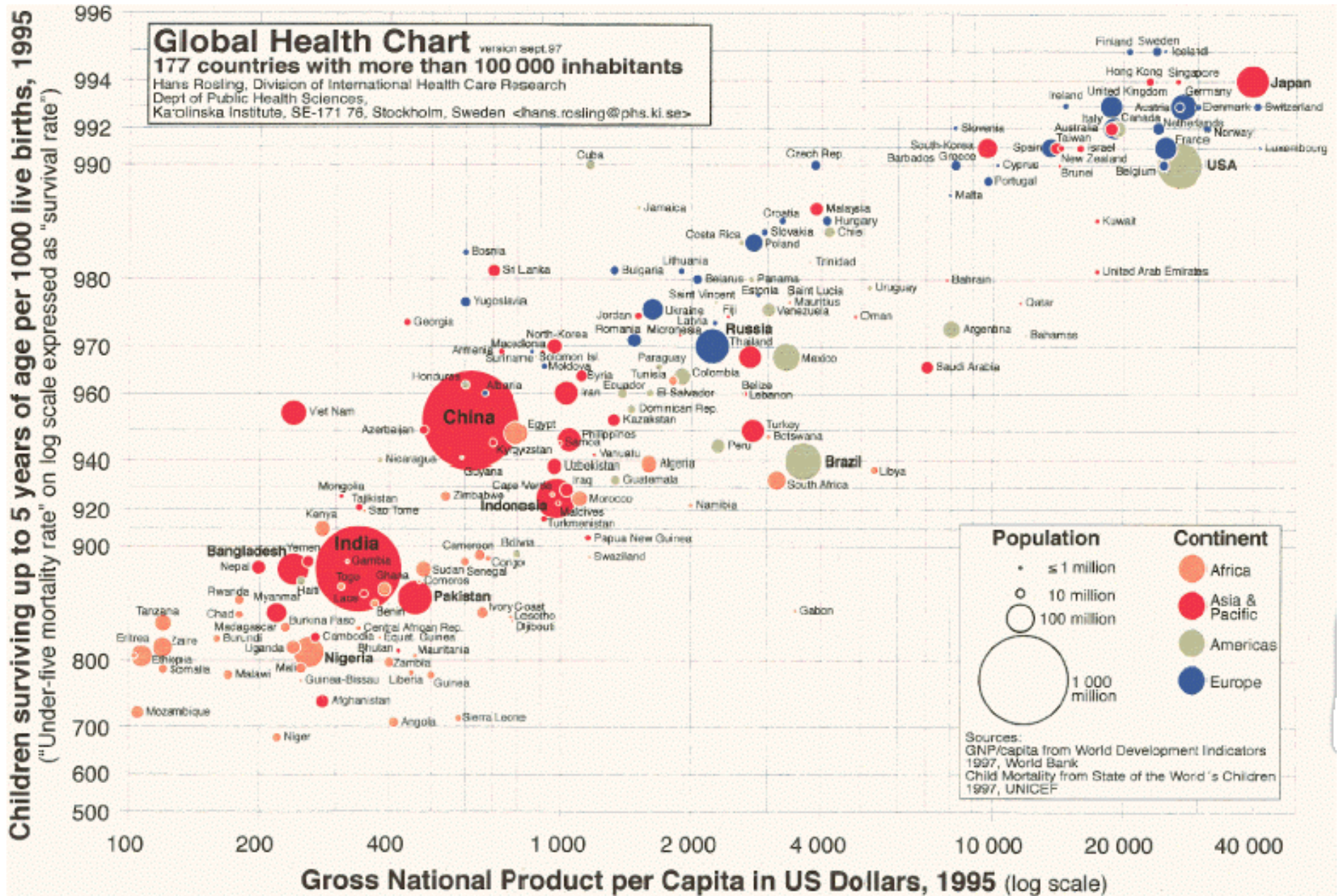
All require a POPULATION ORIENTATION.

Country* Clusters: Health Professional Supply and Child Survival



*186 countries

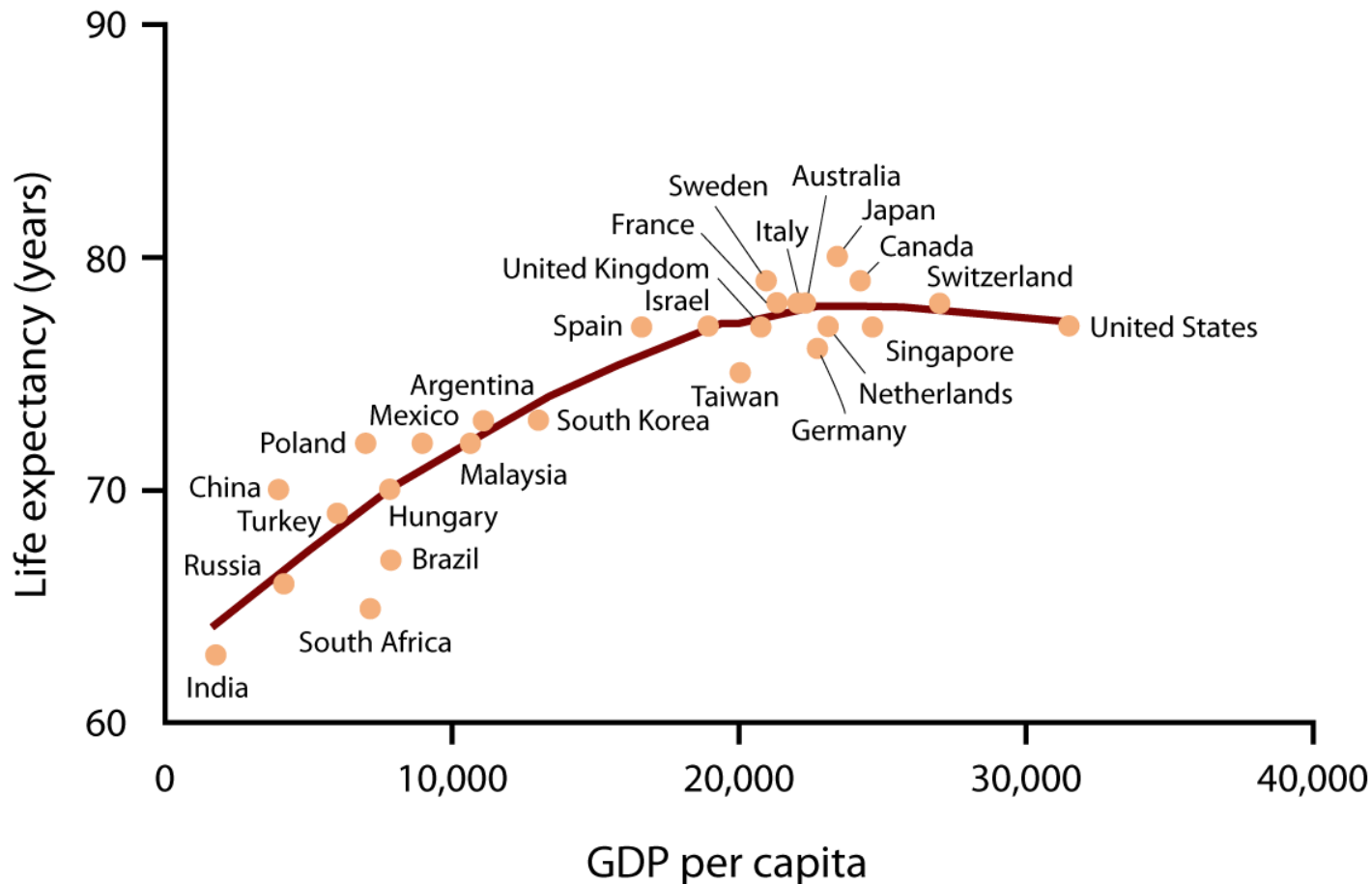
Adapted by CTLT from Chen et al, Lancet 2004; 364:1984-90. Starfield 07/07, HS 6333 n.



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

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Life Expectancy Compared with GDP per Capita for Selected Countries



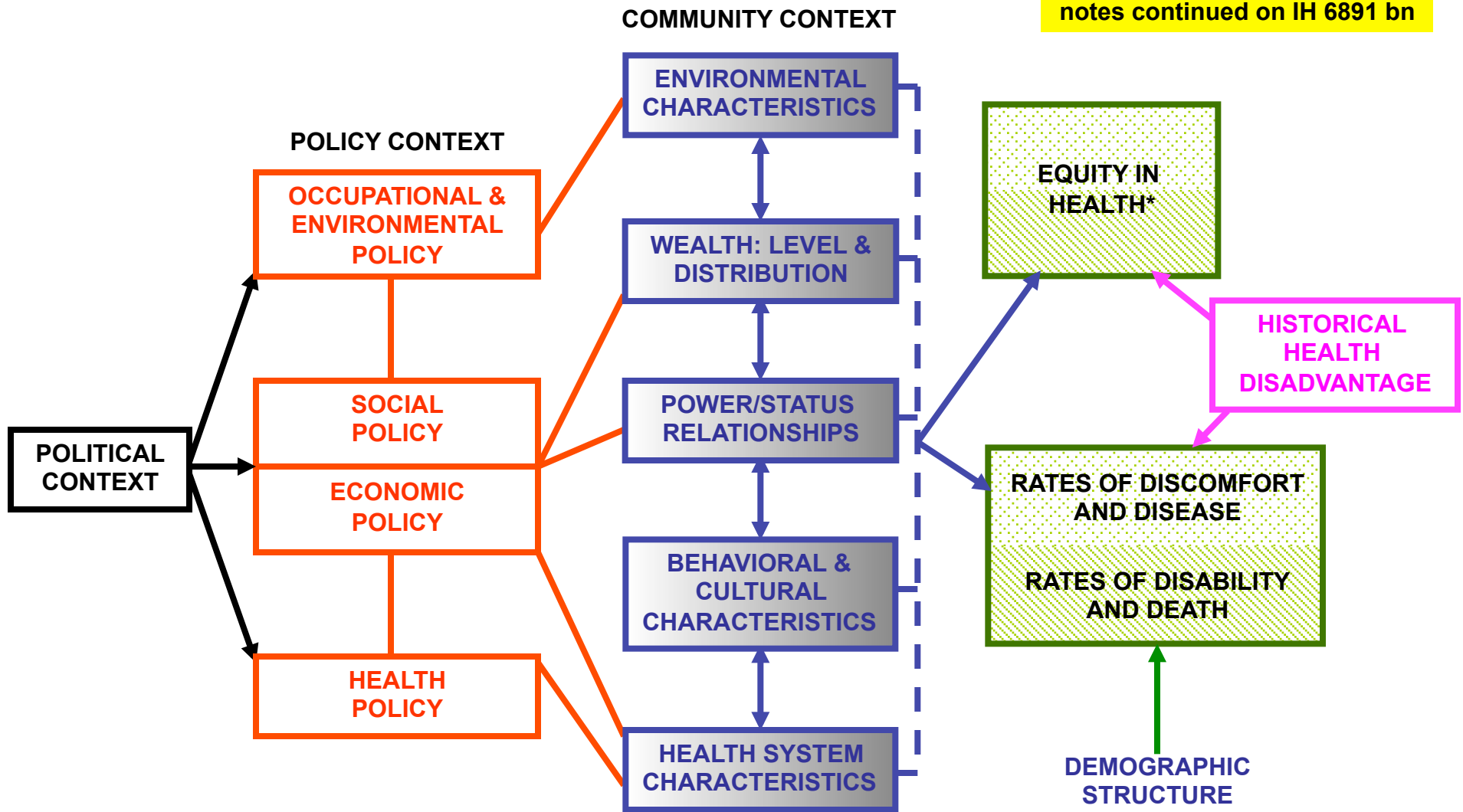
Adapted by CTLT from Economist Intelligence Unit. Healthcare International. 4th quarter 1999. London, UK: Economist Intelligence Unit, 1999. Starfield 11/06, IC 6440 n.



Are there differences in structure, process, and outcomes that can explain variability in health even across areas with similar wealth and resources?

Societal Influences on Population Health and Equity

notes continued on IH 6891 bn

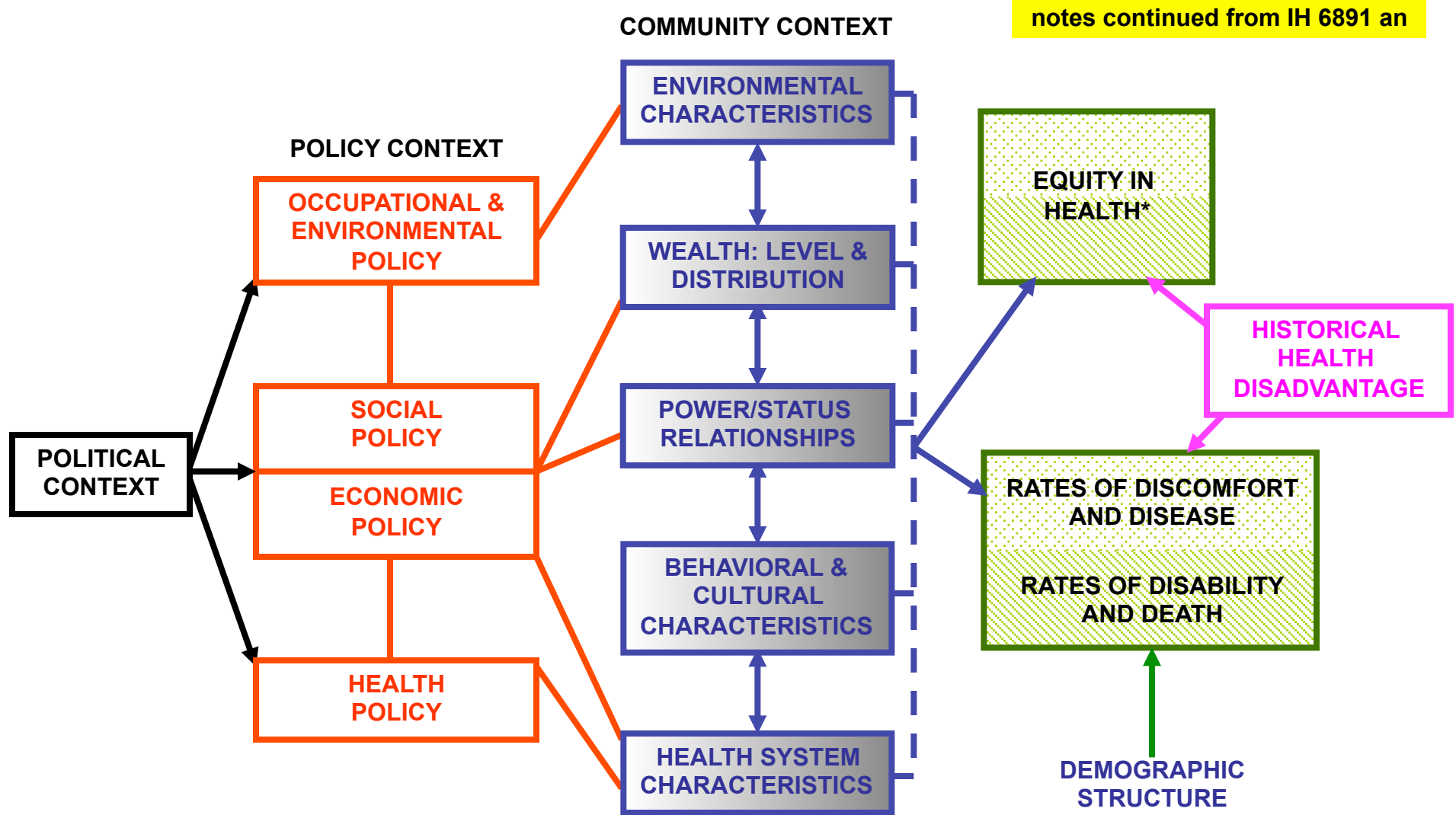


Dashed lines indicate the existence of pathways through individual-level characteristics that most proximally influence health.

Shading represents degree to which characteristics are measured at the ecological level (lighter color) or at the individual level aggregated to community.

**“Health” has two aspects: occurrence (incidence) and intensity (severity).

Societal Influences on Population Health and Equity (continued)



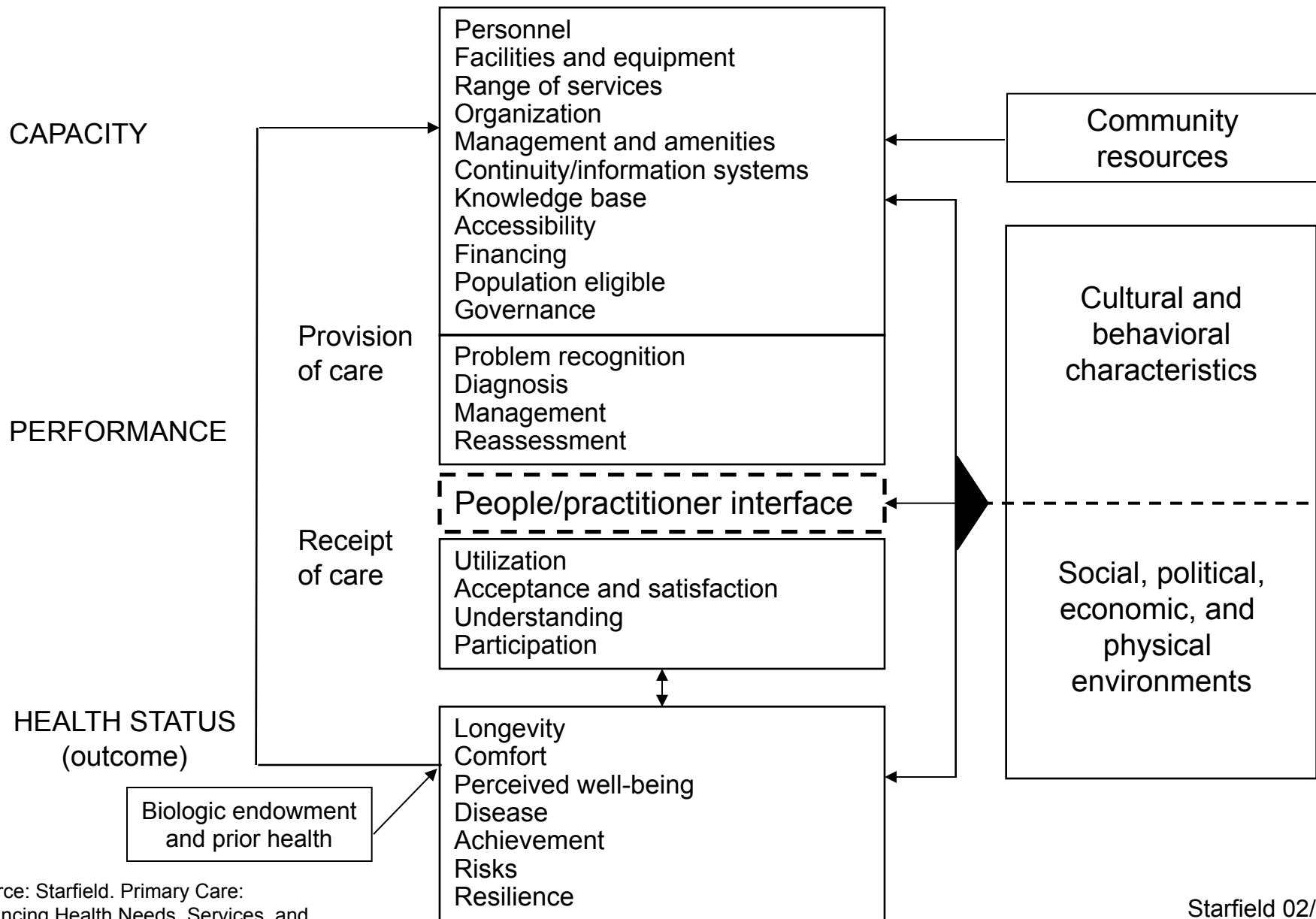
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*"Health" has two aspects: occurrence (incidence) and intensity (severity).

A framework based on structure, process, and outcome is helpful in describing and measuring the components of health services systems.

The Health Services System



Source: Starfield. Primary Care: Balancing Health Needs, Services, and Technology. Oxford U. Press, 1998.

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Primary care is a major component of health services systems.

Primary Health Care and Primary Care

Primary health care is a system-wide approach to designing health services based on primary care.

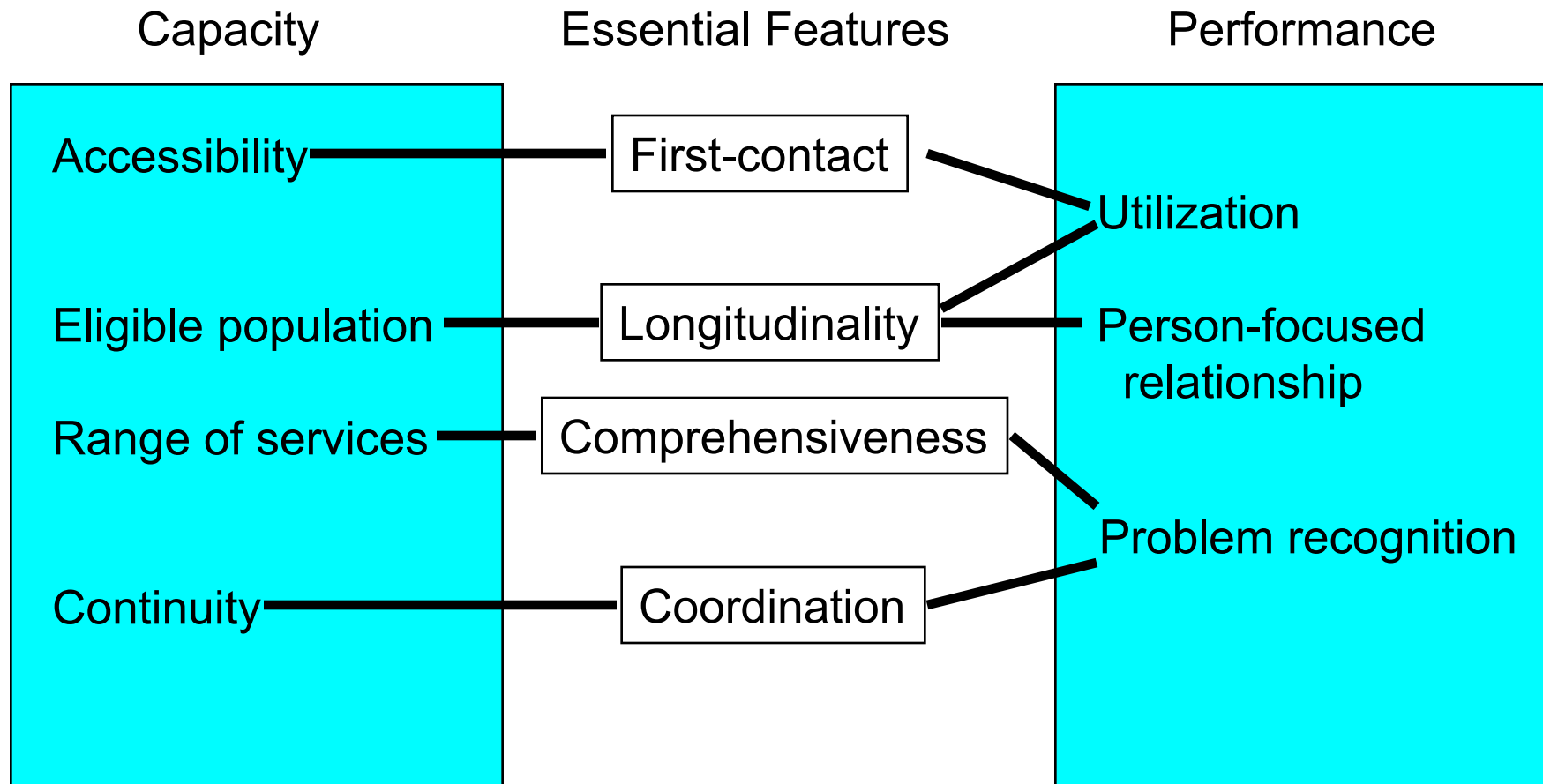
Primary care is the representation, on the clinical level, of primary health care.

The framework of structure, process, and outcome is useful in defining primary care so that it can be measured and evaluated.

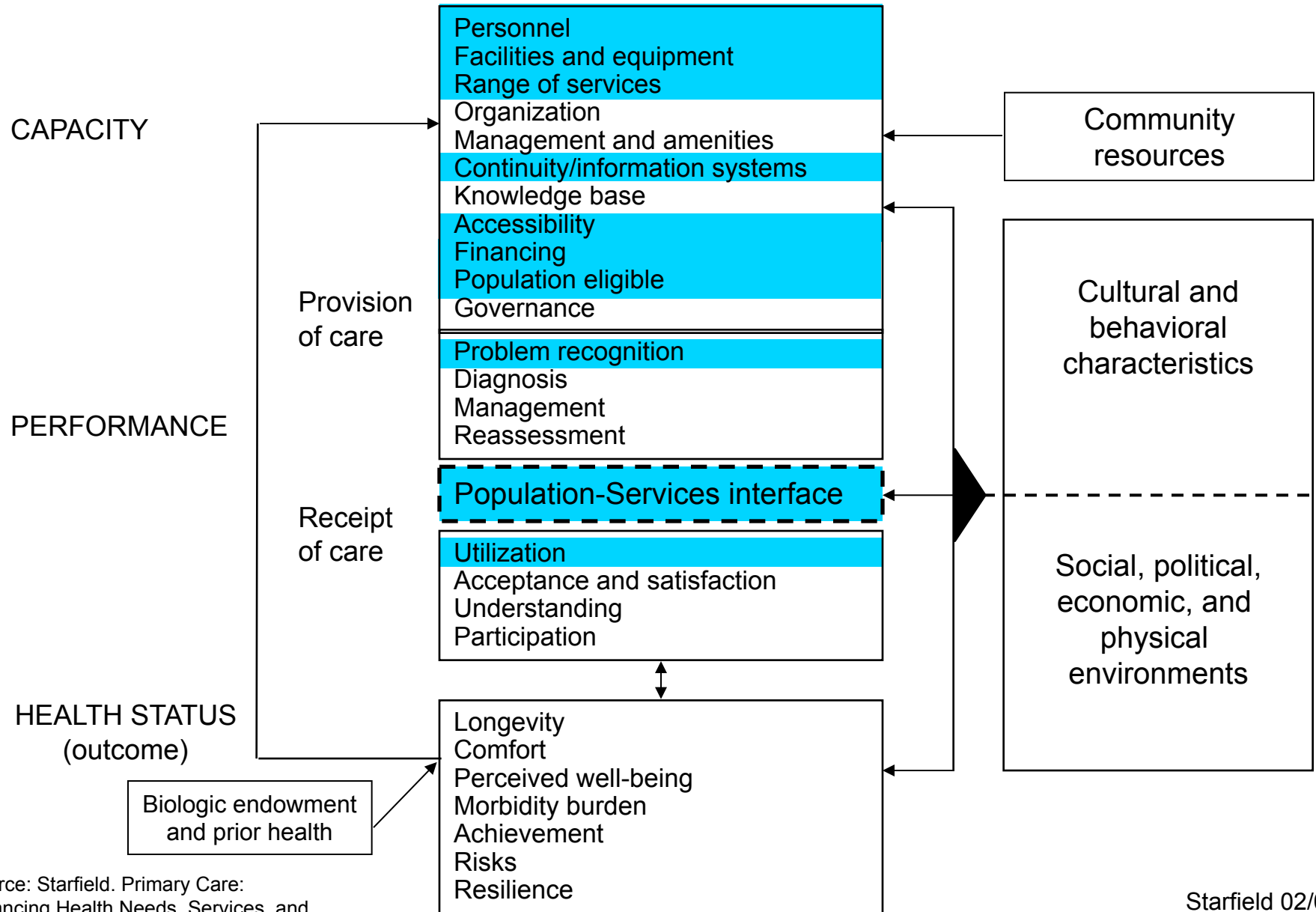
Primary Care

| | |
|---------------|---|
| First Contact | <ul style="list-style-type: none">• Accessibility• Use by people for each new problem |
| Longitudinal | <ul style="list-style-type: none">• Relationship between a facility and its population• Use by people over time regardless of the type of problem; person-focused character of provider/patient relationship |
| Comprehensive | <ul style="list-style-type: none">• Broad range of services• Recognition of situations where services are needed |
| Coordination | <ul style="list-style-type: none">• Mechanism for achieving continuity• Recognition of problems that require follow-up |

Structural and Process Elements of the Essential Features of Primary Care



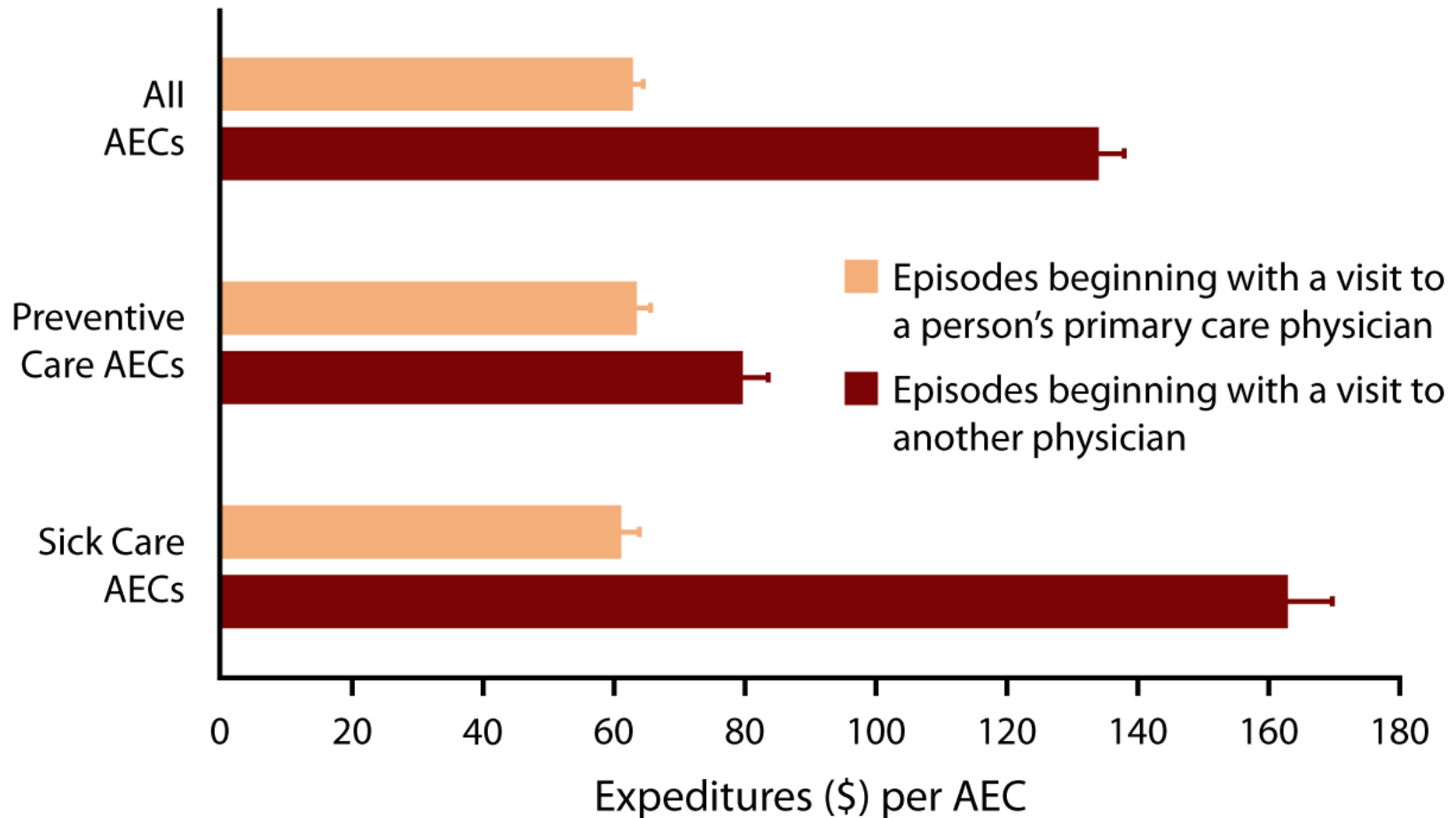
Primary Health Care Oriented Health Services Systems



Source: Starfield. Primary Care: Balancing Health Needs, Services, and Technology. Oxford U. Press, 1998.

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HS 6848 n

First Contact Care and Health Spending



Adapted by CTLT from Forrest & Starfield, J Fam Pract 1996; 43:40-8.
Starfield 08/02, FC 5922 n.

Benefits of Longitudinality (Person-centered over Time), Based on Evidence from the Literature

| | Identification with a Person | Identification with a Place |
|----------------------------------|---------------------------------|--------------------------------|
| Better problem/needs recognition | ++ | |
| More accurate/earlier diagnosis | ++ | |
| Better concordance | | |
| Appointment keeping | ++ | ++ |
| Treatment advice | ++ | |
| Less ER use | ++ | |
| Fewer hospitalizations | ++ | + |
| Lower costs | ++ | + |
| Better overall prevention | ++ | ++ |
| Better monitoring | + | |
| Fewer drug prescriptions | + | |
| Less unmet needs | ++ | + |
| Increased satisfaction | ++ | |

++*Evidence good*

+*Evidence moderate*

Criteria for Comprehensiveness

In US studies: universal provision of extensive and uniform benefits for children, the elderly, women, and other adults; routine OB care; mental health needs addressed; minor surgery; generic preventive care

In European studies: treatment and follow-up of diseases (e.g., hypothyroidism, acute CVA, ulcerative colitis, work-related stress, n=17); technical procedures (e.g., wart removal, IUD insertion; removal of corneal rusty spot; joint injections); taking cervical smears; group health education; family planning and contraception

Coordination

Coordination requires transfer of information (a structural element) and the recognition of that information in the ongoing care of a patient (a process element).

Modes of transfer are multiple: conventional medical records, patient-held records; smart cards; electronic medical records; multidisciplinary teams with specified complementary, supplementary, and substitutive functions of each team member.

These different types have not been compared with regard to effectiveness and efficiency, but developing countries (in particular) are exploring the potential of community workers in assuming explicit responsibility for a variety of primary care tasks in conjunction with personnel in health centers where they exist.

There are structural, process, and outcome features that characterize primary HEALTH care, that is, primary care at the policy level.

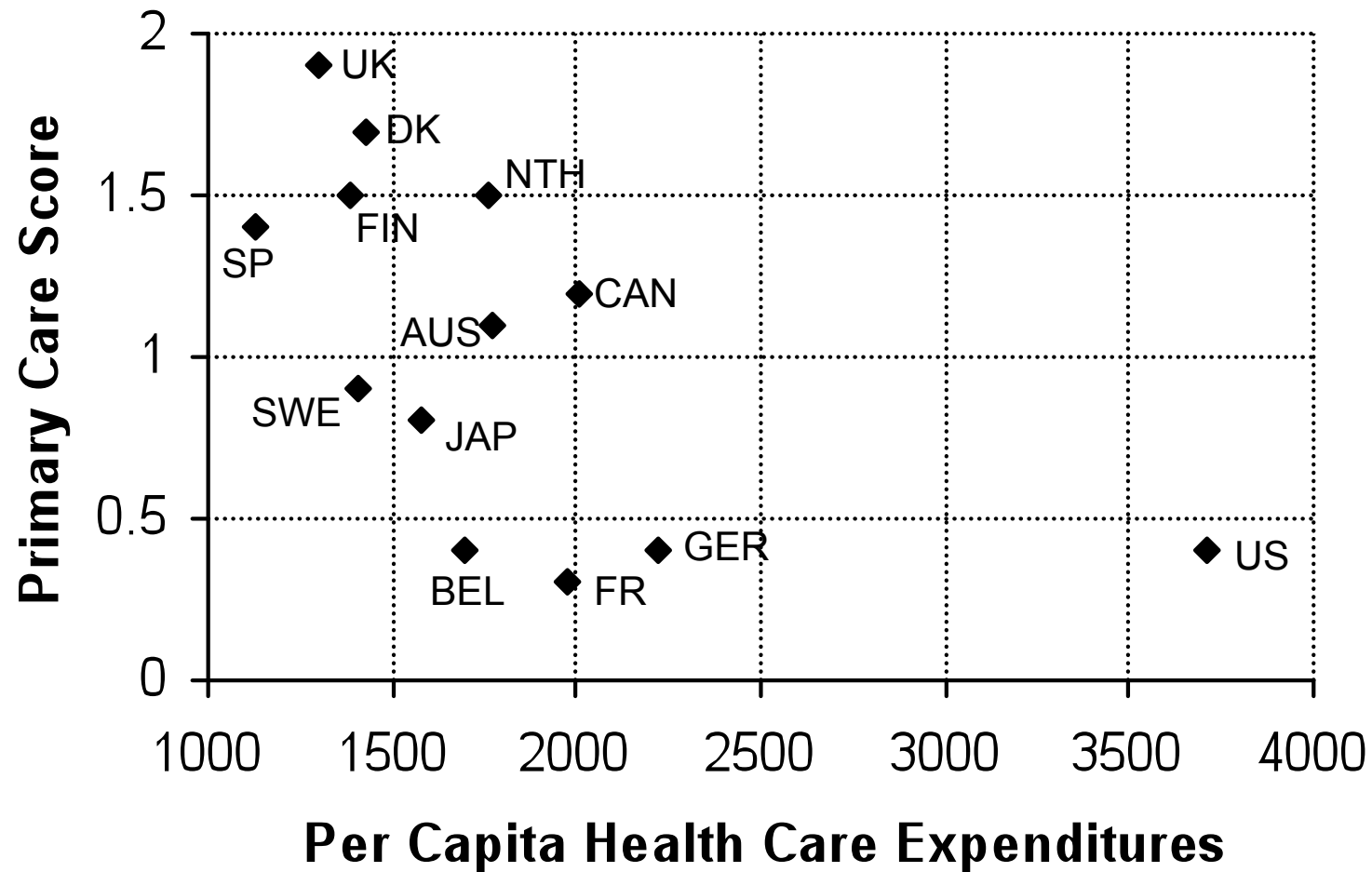
The critical structural features are equitable distribution of resources (Personnel and Facilities); government control or regulation of financing and low or no copayments for primary care services (Financing); and Definition of the Eligible Population. A remaining question is the extent of importance of mechanisms of Governance, which have been poorly studied.

Primary Care Scores, 1980s and 1990s

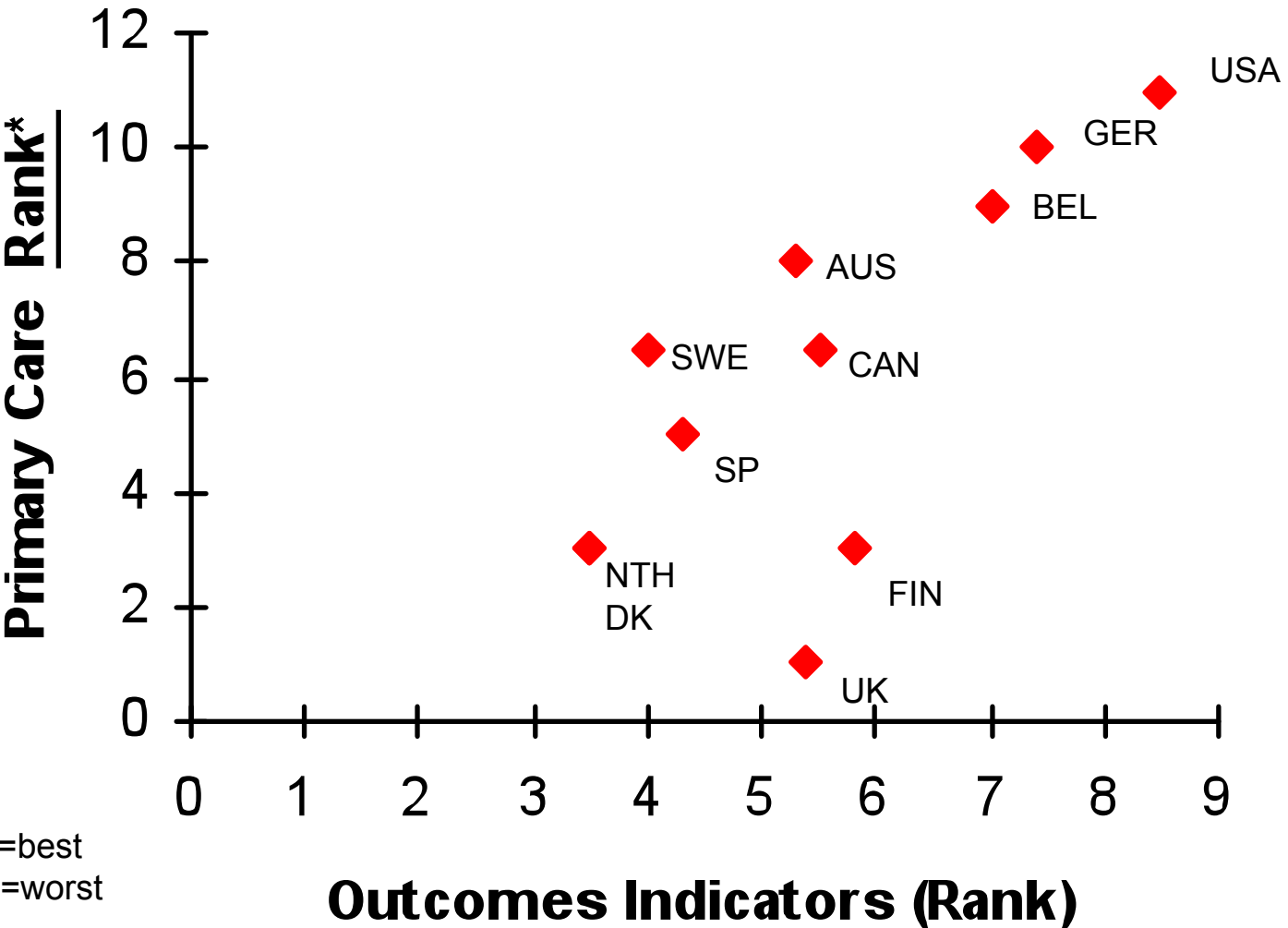
| | 1980s | 1990s |
|----------------|-------|-------|
| Belgium | 0.8 | 0.4 |
| France* | - | 0.3 |
| Germany | 0.5 | 0.4 |
| United States | 0.2 | 0.4 |
| Australia | 1.1 | 1.1 |
| Canada | 1.2 | 1.2 |
| Japan* | - | 0.8 |
| Sweden | 1.2 | 0.9 |
| Denmark | 1.5 | 1.7 |
| Finland | 1.5 | 1.5 |
| Netherlands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

*Scores available only for the 1990s

Primary Care Score vs. Health Care Expenditures, 1997



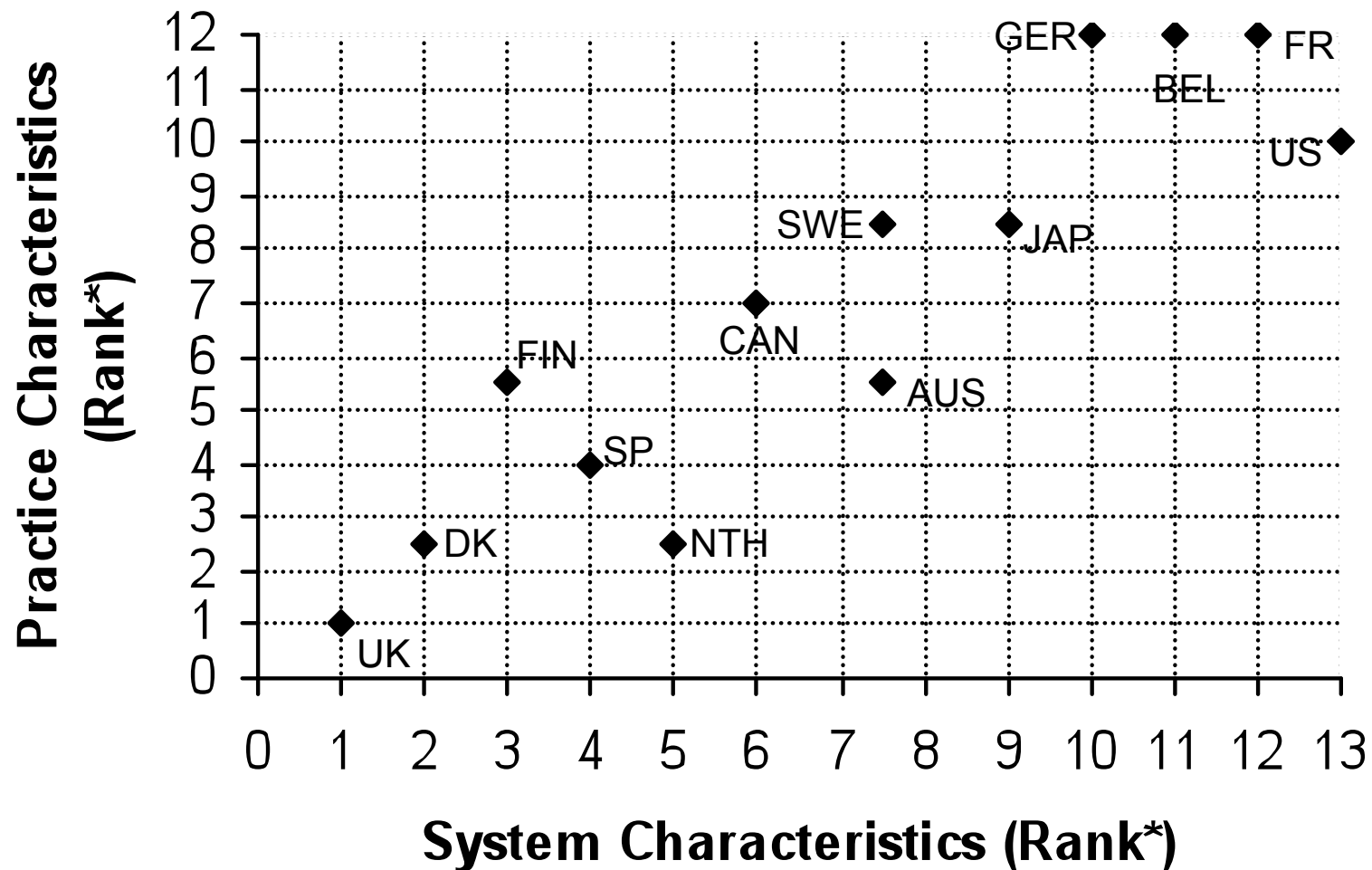
Relationship between Strength of Primary Care and Combined Outcomes



*1=best
11=worst

Source: Starfield. Primary Care: Balancing Health Needs, Services, and Technology. Oxford U. Press, 1998.

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 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

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

Sources: Starfield & Shi, Health Policy 2002; 60:201-18.
Gilson et al, Challenging Inequity through Health Systems
(
http://www.who.int/social_determinants/resources/csdh_media/hskn_final_2007_en.pdf; accessed March 17, 2009).

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GH 6739 n

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.

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.

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.

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.

Percentage Reduction in Under-5 Mortality: Thailand, 1990-2000

| | |
|-----------------------------|----|
| Poorest quintile (1) | 44 |
| (2) | 41 |
| (3) | 22 |
| (4) | 23 |
| Richest quintile (5) | 13 |
| Rate ratio (Q1/Q5) | 55 |
| Absolute difference (Q1-Q5) | 61 |

Policy changes:

- 1989 At least one primary care health center for each rural village
 - 1993 Government medical welfare scheme: all children less than 12, elderly, disabled
 - 2001 Entire adult population insured
- Activities of Rural Doctors' Society

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.”

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.

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IC 6234 n

System Features Important to Primary Health Care

| | Resource Allocation (Score) | Progressive Financing* | Cost Sharing | Compre- hensiveness | |
|-------------|-----------------------------------|---------------------------|-----------------|------------------------|-------------------|
| Belgium | 0 | 0 | 0 | 0 | |
| France | 0 | 0 | 0 | 0 | |
| Germany | 0 | 1 | 2 | 0 | |
| US | 0 | 0** | 0 | 0 | |
| Australia | 1 | 2 | 2 | 2 | |
| Canada | 1 | 2 | 2 | 2 | |
| Japan | 1 | 2 | 1 | 1 | |
| Sweden | 2 | 2 | 1 | 1 | *0=all regressive |
| Denmark | 2 | 2 | 2 | 2 | 1=mixed |
| Finland | 2 | 2 | 1 | 2 | 2=all progressive |
| Netherlands | 2 | 0 | 2 | 2 | **except Medicaid |
| Spain | 2 | 2 | 2 | 1 | |
| UK | 2 | 2 | 2 | 2 | |

Sources: Starfield. Primary Care: Balancing Health Needs, Services, and Technology. Oxford U. Press, 1998. van Doorslaer et al. Equity in the Finance and Delivery of Health Care: An International Perspective. Oxford U. Press, 1993.

Starfield 11/06
EQ 5599 n

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

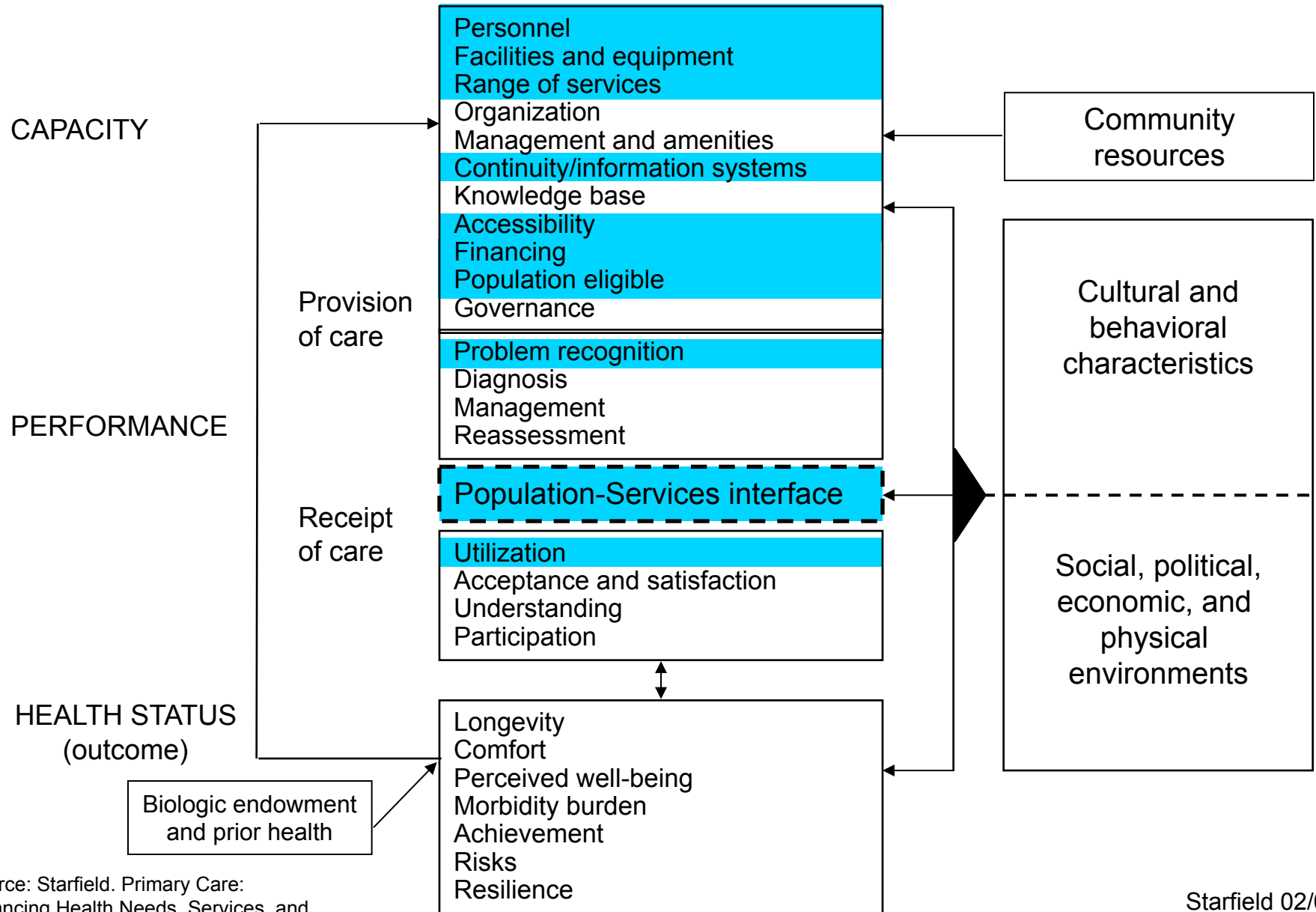
For outcomes, the imperative is to replace the primary focus on DISEASE with a focus on ILLNESS, substituting a multi-domain conceptualization for a disease-by-disease accounting of health statistics.

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

Sources: Chin. The AIDS Pandemic: the Collision of Epidemiology with Political Correctness. Radcliffe Publishing, 2007. De Maeseneer et al. Primary Health Care as a Strategy for Achieving Equitable Care: a Literature Review Commissioned by the Health Systems Knowledge Network. WHO Health Systems Knowledge Network, 2007. Available at: http://www.who.int/social_determinants/resources/csdh_media/primary_health_care_2007_en.pdf. Mangin et al, BMJ 2007; 335:285-7. Murray et al, BMJ 2004; 329:1096-1100. Tinetti & Fried, Am J Med 2004; 116:179-85. Walker et al, Lancet 2007; 369:956-963. Rosenberg, Milbank Q 2002;80:237-60. Moynihan & Henry, PLoS Med 2006;3:e191.

Primary Health Care Oriented Health Services Systems



Source: Starfield. Primary Care: Balancing Health Needs, Services, and Technology. Oxford U. Press, 1998.

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HS 6848 n