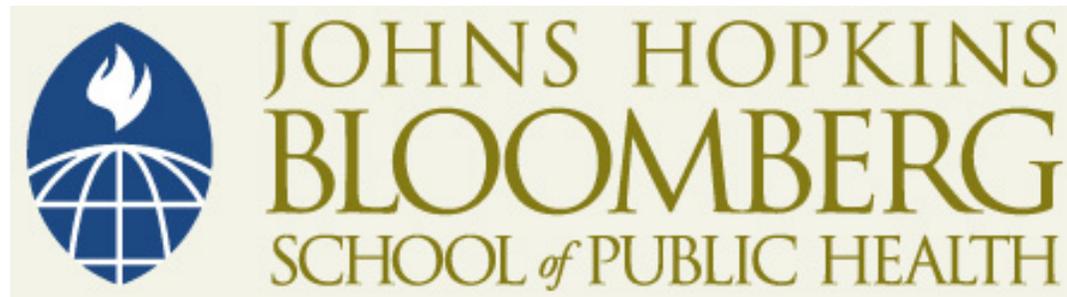


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Diseases, Chronic Care, and Primary Care

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Sommer Memorial Lecture (Portland, OR, 2010)

The purpose of this presentation is to explore the concepts of “disease” and “chronic disease” and to show why a more appropriate focus is on a continuum of care (“primary care”) for all people and populations rather than on care for targeted diseases.

- Most diseases are not discrete biological entities.
- Specific diseases do not exist in isolation from other health problems.
- The course of most chronic diseases is not predictable.
- Many health problems are “chronic” but are usually not considered so.
- Focusing care on selected chronic conditions is not likely to improve the health of populations and may not improve the health of individuals.
- A more appropriate way to organize care is through person (not disease) focused health services that take into account different degrees of “morbidity burden” in people and populations.

The IOM report, *Crossing the Quality Chasm*, urges selecting priority conditions for attention to the quality of care. The list from which they should be chosen includes cancer, diabetes, emphysema, high cholesterol, HIV/AIDS, hypertension, ischemic heart disease, stroke, and perhaps also arthritis, asthma, gall bladder disease, stomach ulcers, back problems, Alzheimers, depression, anxiety disorders.

Why aren't undernutrition, occupational diseases, osteoporosis, low birth weight and prematurity, or virtually any childhood disorder (except asthma) considered high priority? Who should decide what a priority disease is? The disease experts?

Top Ten Health Conditions and Impact on Costs

| | Medical and Rx costs | Lost productivity costs | Total costs |
|----|---------------------------------|-------------------------|--------------------|
| 1 | Other cancer | Fatigue | Back/neck pain |
| 2 | Back/neck pain | Depression | Depression |
| 3 | Coronary heart disease | Back/neck pain | Fatigue |
| 4 | Other chronic pain | Sleeping problem | Other chronic pain |
| 5 | High cholesterol | Other chronic pain | Sleeping problem |
| 6 | Gastroesophageal reflux disease | Arthritis | High cholesterol |
| 7 | Diabetes | Hypertension | Arthritis |
| 8 | Sleeping problem | Obesity | Hypertension |
| 9 | Hypertension | High cholesterol | Obesity |
| 10 | Arthritis | Anxiety | Anxiety |

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.

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 and progression of illness, the role of risk factors, and the impact of interventions, goes unrecognized.

Everyone knows that cardiovascular disease is the leading cause of death, but what is it?

It is “hypertensive DISEASES, ischemic heart DISEASES, rheumatic fever, pulmonary heart disease and DISEASES of the pulmonary circulation, OTHER FORMS of heart disease, cerebrovascular DISEASES or stroke, DISEASES of veins, lymphatic vessels, and lymph nodes, OTHER AND UNSPECIFIED DISORDERS OF THE CIRCULATORY SYSTEM, AND congenital MALFORMATIONS, or birth defects of the circulatory system.”

What and for whom is there benefit from calling it a disease – or the leading cause of death?

There appear to be many disorders included under the rubric of diabetes: insulin secretion; insulin transport; zinc-binding to insulin; and pancreatic islet beta cell development.

IS DIABETES A DISEASE? DOES IT MAKE SENSE TO ASSUME THAT GUIDELINES FOR THE IDENTIFICATION AND MANAGEMENT OF DIABETES APPLY TO ALL “DIABETICS”?

In a relatively small-scale study, diabetics who have weight loss are five times more likely to have their diabetes disappear than diabetics who have standard diabetes care.

Questions: Is diabetes a “chronic disease”? Is it a disease?

If the association between obesity and diabetes is absent in people with low concentrations of persistent organic pollutants, and the association becomes stronger as the concentration of these pollutants rises, is obesity a risk factor for diabetes? Is diabetes a single disease?

If three diabetics per one thousand per year die from the implementation of supposedly evidence-based treatment, is diabetes a single disease?

There is broad variation in breast cancer risk among carriers of BRCA1 and BRCA2 mutations.

Question: Is BRCA1 and BRCA2-related breast cancer a disease?

If a 90-year-old woman dies two months following hip fracture, did she die from an acute disease or a chronic disease?

What is the “cause of death” likely to be coded as?

If oral contraceptives are protective on epithelial and non-epithelial cervical cancer but not on mucinous cervical cancer, is cervical cancer a single disease?

COPD is a chronic systemic inflammatory syndrome with complex chronic comorbidities. Patients with COPD mainly die of non-respiratory disorders such as cardiovascular disease or cancer.

COPD is a heterogeneous disease process. Although exacerbations of COPD, especially those defined as being infectious, are quite frequent, the number of randomized placebo-controlled trials of antibiotics is surprisingly small.

When occurring in the same individual, BMI greater than 30, systolic blood pressure greater than 140, and blood cholesterol greater than 250 mg/dL are associated with a six-fold increased odds of Alzheimers disease.

What type of disease is Alzheimers?
What is the disease?

Hypothyroidism is three times more likely in women with rheumatoid arthritis than in the general population. Women with both conditions have a fourfold higher risk of cardiovascular disease than euthyroid women with arthritis, independent of conventional risk factors. Inflammation and autoimmunity are implicated in vulnerability to a wide variety of “chronic” diseases – and they may well be “acute”.

What Is a Chronic Disease?

Generally defined as persistence or recurrence, usually beyond one year

Chronic Disease: Expanded Definition

- Incurable
- Complex “causation”
- Multiple risk factors
- Long latency
- Prolonged course
- Associated with functional impairment or disability

Not all chronic diseases are manifested year to year.

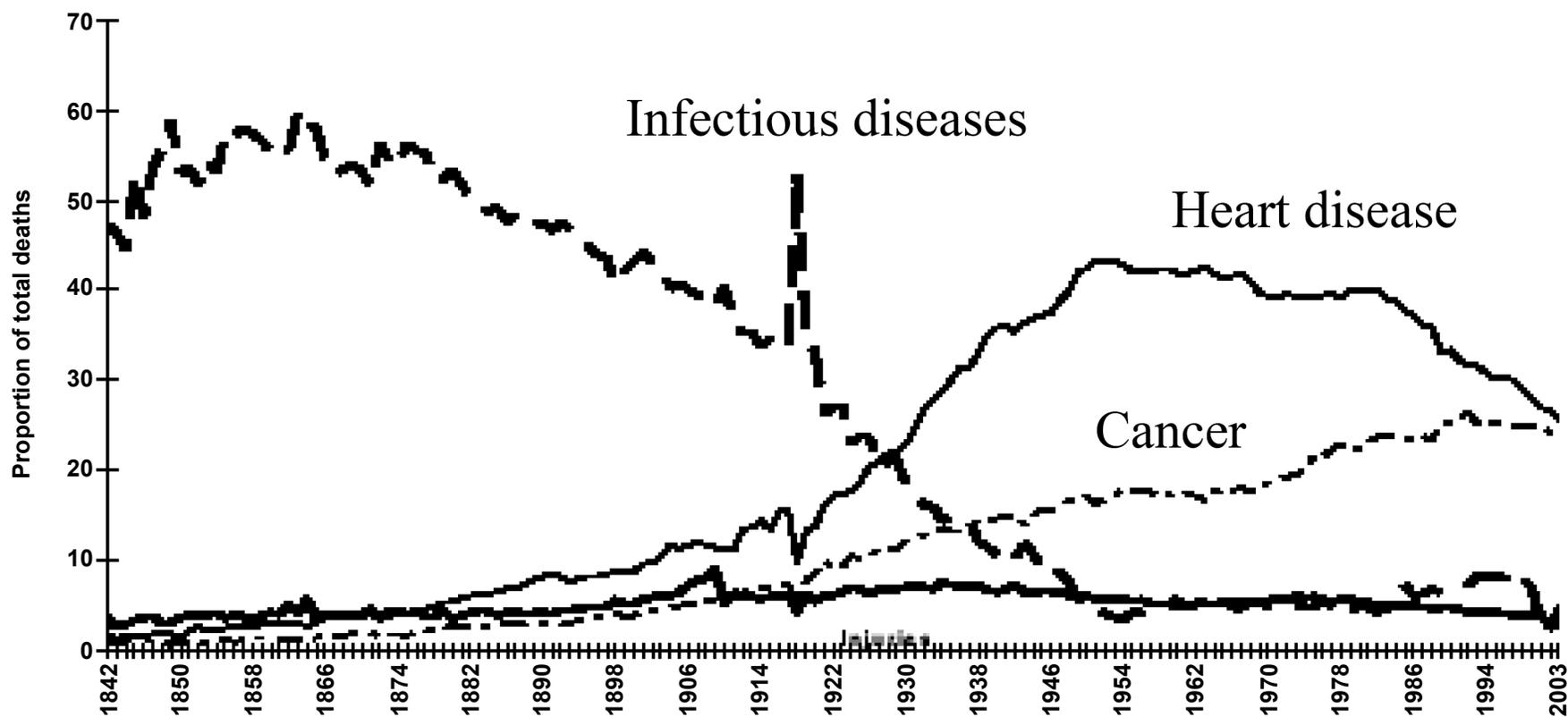
Acute diseases sometimes behave as if they were chronic, recurring year to year.

Only a minority of common chronic diseases or conditions are currently candidates for the vast majority of chronic disease management programs.

Acute and chronic conditions share a characteristic: inflammation.

Of all global deaths in 2005, 60% were said to be caused by chronic diseases, principally cardiovascular diseases (32%), cancers (13%), and chronic respiratory diseases (7%). Data such as these are used to argue that chronic diseases are of growing and epidemic importance as causes of death.

Question: What is the appropriate target for the percentage of deaths in the world that are attributable to chronic diseases? Isn't there a case to be made that perhaps ALL deaths should be due to chronic diseases, with acute illnesses falling towards zero percentage?



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 comorbidity

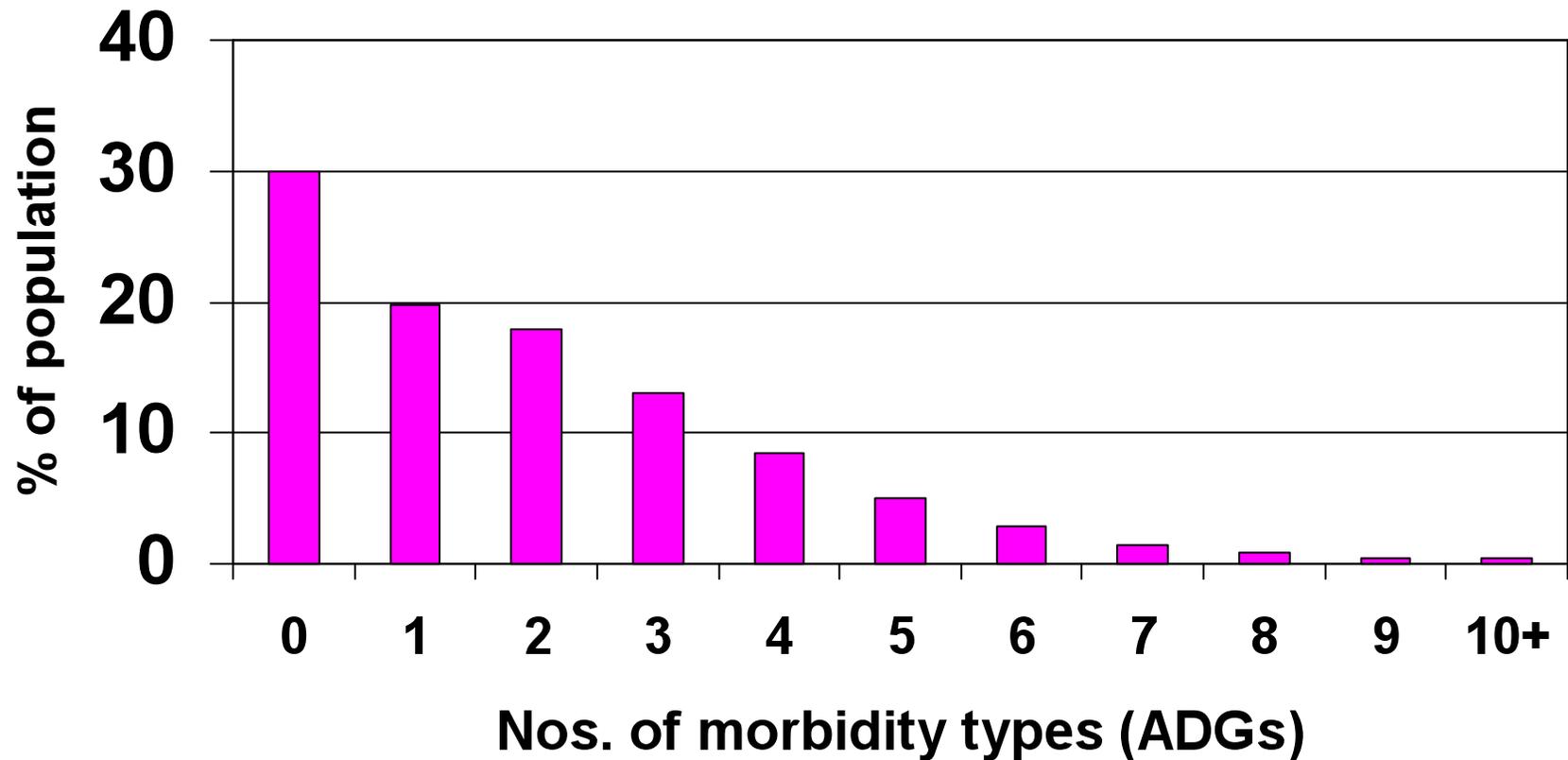
People and populations differ in their overall vulnerability and resistance to threats to health. Some have more than their share of illness, and some have less. Morbidity mix (sometimes called case-mix) describes this clustering of ill health in patients and populations.

Co- and Multimorbidity (Morbidity Burden)

Comorbidity is the concurrent existence of one or more unrelated conditions in an individual with any given condition. Multimorbidity is the co-occurrence of biologically unrelated illnesses.

For convenience and by common terminology, we use comorbidity to represent both co- and multimorbidity.

Distribution of Morbidity in a Non-Elderly Insured Population: 1 Year Experience (US)



Source: HMO health plan with 500K members.

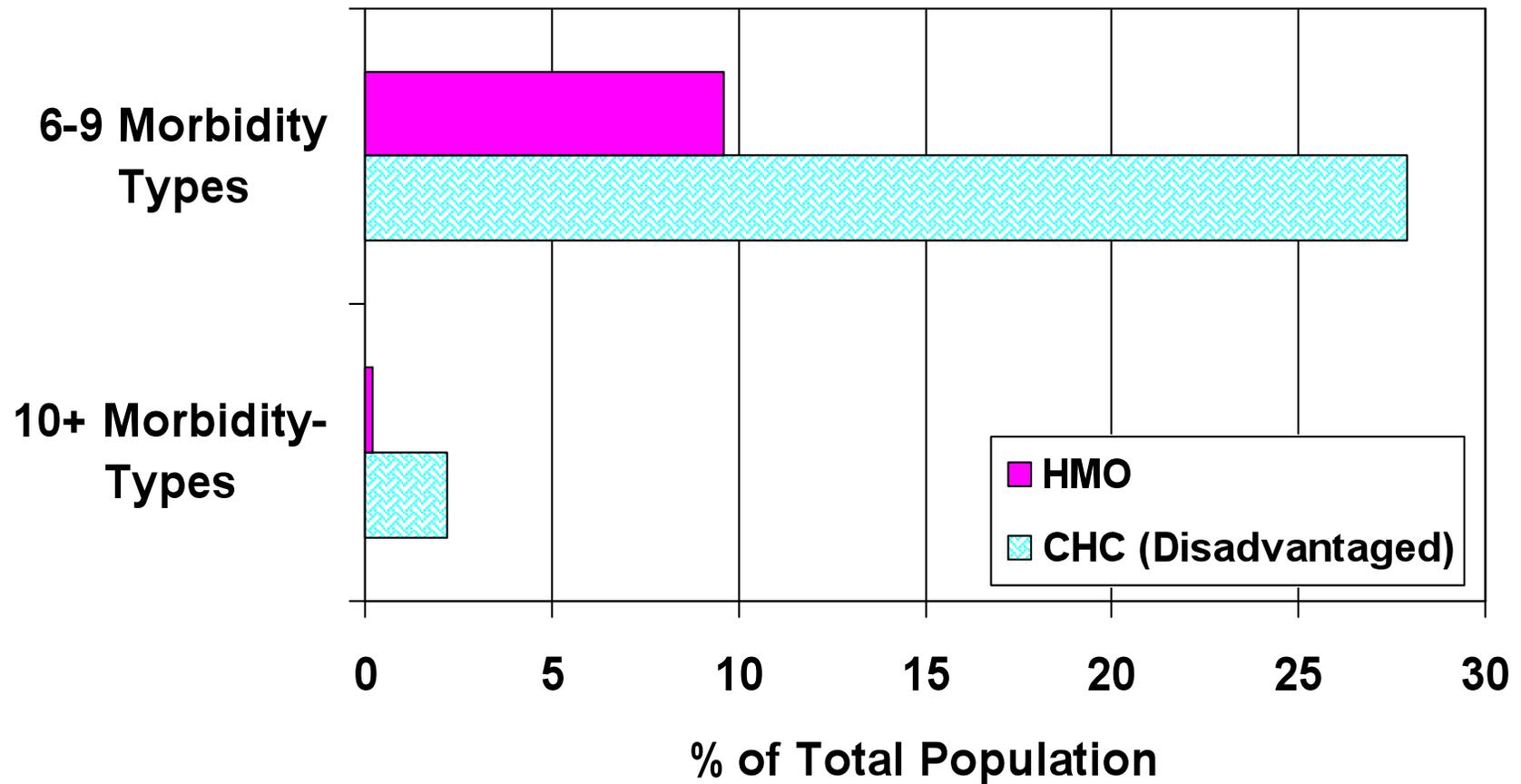
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As thresholds for diagnosing disease are lowered over time, the variability within “diseases” will increase even further, as will the prevalence of multiple simultaneous or sequential diseases.

Increase in Treated Prevalence: Selected Conditions, US, People with Private Insurance, 1987-2002

| | <u>Treated Prevalence Percentage Change, 1987-2002</u> |
|-------------------------|--|
| Hyperlipidemia | 437 |
| (Heart disease | 9) |
| Bone disorders | 227 |
| Upper GI problems | 169 |
| Cerebrovascular disease | 161 |
| Mental problems | 136 |
| Diabetes | 64 |
| Endocrine disorders | 24 |
| Hypertension | 17 |
| Bronchitis | 13 |

Morbidity Burdens of Socially Disadvantaged and Socially Advantaged People



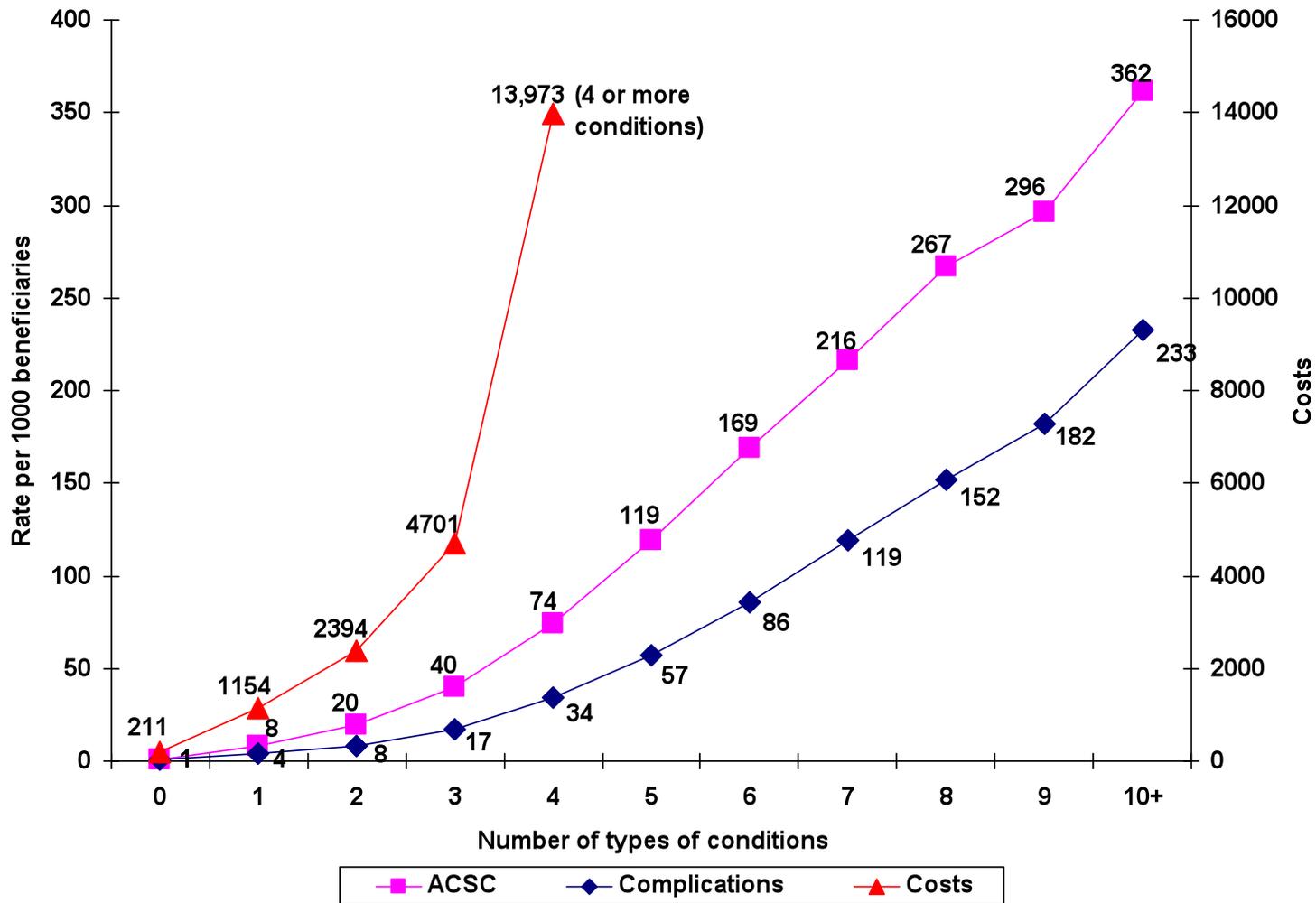
Summary of Predictability of Year 1 Characteristics, with Regard to Subsequent Year's (3 or 5) Costs

| | Rank for relative risk | Under-predictive* | Over-predictive |
|--------------------------------------|------------------------|-------------------|-----------------|
| 1+ hospitalizations | 5 | 90% | 40% |
| 8+ morbidity types (ADGs) | 2 | 64% | 55% |
| 4+ major morbidity types (ADGs) | 1 | 75% | 30% |
| Top 10th percentile for costs (ACGs) | 4 | 96% | 70% |
| 10+ specific diagnoses | 3 | 82% | 40% |

*Underpredictive: % of those with subsequent high cost who did not have the characteristic

Overpredictive: % with characteristic who are not subsequently high cost

Comorbidity, Inpatient Hospitalization, Avoidable Events, and Costs*



Source: Wolff et al, Arch Intern Med 2002; 162:2269-76.

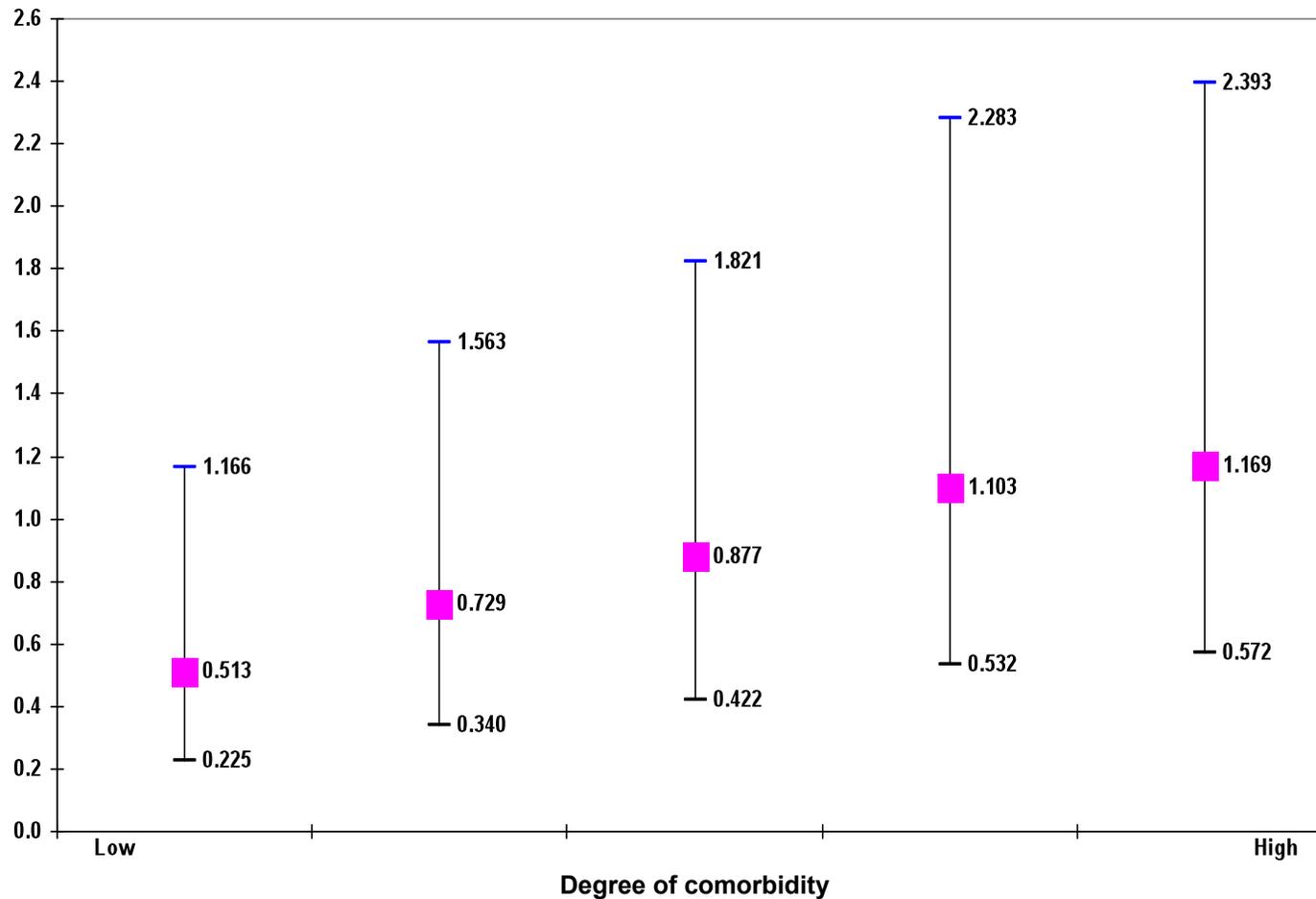
*ages 65+, chronic conditions only

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The greater the morbidity burden,
the greater the persistence of any
given diagnosis.

That is, with high comorbidity,
even acute diseases are more
likely to persist.

Odds Ratios and Confidence Intervals for Persistence* by Degree of Comorbidity: Urinary Tract Infection



*controlled for age and sex

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

| | None | Low | Medium | High | Very High |
|-------------------------------|------|-----|--------|------|-----------|
| Acute conditions only | 0.1 | 0.4 | 1.2 | 3.3 | 9.5 |
| Chronic condition | 0.2 | 0.5 | 1.3 | 3.5 | 9.8 |
| High impact chronic condition | 0.2 | 0.5 | 1.3 | 3.6 | 9.9 |

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

Influences* on Use of Family Physicians and Specialists, Ontario, Canada, 2000-1

| Type of influence | Primary care visits | | | Specialty visits | | |
|---------------------------------------|---------------------|--------|-------------|------------------|--------|-------------|
| | Mean | Median | One or more | Mean | Median | One or more |
| # different types of morbidity (ADGs) | 1 | 1 | 1 | 1 | 1 | 1 |
| Morbidity burden (ACGs) | 2 | 2 | 2 | 2 | 2 | 2 |
| Self-rated health | 3 | 3 | 5 | 3 | - | 5 |
| Disability | 4 | 4 | 4 | 4 | 4 | 4 |
| # chronic conditions** | 5 | 5 | 3 | - | - | - |
| Age 65 or more | - | - | - | 5 | 3 | 3 |

*top five, in order of importance

**from a list of 24, including “other longstanding conditions”

**It's comorbidity that
is the problem, not
chronic diseases.**

What is needed is
person-focused care
over time, NOT
disease-focused care.

PERSON-FOCUSED CARE means taking into account all life-threatening, disability-inducing, and health-compromising conditions that people encounter in daily life, whether they are the conventionally “chronic” conditions, other “chronic” conditions (such as incontinence, post-stroke impairment, and hearing loss), chronic conditions that are acute but likely to recur (such as sinusitis and urinary tract infection), or acute conditions that predispose people to other conditions and to disability.

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

Although current knowledge permits development of some disease-oriented quality standards, there are NO standards for adequacy of person-focused care, appropriateness of referrals, or adequacy of specialty care.

Disease-oriented guidelines have limitations when people also have other diseases (i.e., most people).

- Relative importance of treatment to overall health must be considered.
- Interacting and contraindicated medications must be avoided.
- Worsening of overall health is a threat.

Why Do Current Concepts of “Chronic Disease” Only Focus on a Small Subset of Chronic Health Needs in Populations?

- Pharmaceutical company interests in conventional diseases, and in the creation of new diseases treatable by drugs?
- Vested interests of medical academia/specialty societies in conventional diseases?
- Clinical rather than population focus in determining priorities for intervention?
- Focus on meeting patient demands instead of population needs?

The global imperative is to organize health systems around strong, patient-centered, i.e., Primary Care.

A disease-by-disease approach will not address the most serious shortfall in achieving the health-related Millennium Development Goals. It will also worsen global inequities. Those exposed to a variety of interacting influences are vulnerable to many diseases. Eliminating diseases one by one will not materially reduce the chances of others.