als that support a longitudinal relationship basis for health care surely are important parts of the solution to inequalities in health and health care. This relationship between primary care clinicians and their patients—continuity of care—will be a focus of the next issue of *Annals*.

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**EDITORIAL**

**Two Cheers for Ecology**

*Kerr L. White, MD*

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*All models are wrong, some are useful.*

Anonymous

In this issue, Fryer and colleagues⁵ set new standards and aspirations for health information. They have exploited event data from the Medical Expenditure Panel Survey (MEPS) to estimate monthly rates of persons per 1,000 US noninstitutionalized population with 9 personal characteristics using 5 sources of care. This landmark accomplishment with potential policy implications extends the original ecology model created by John and Elizabeth Horder⁴ almost 50 years ago for their London practice. Previous applications⁵,⁶ have helped many educators, but the impact on health policy appears to have been limited. This iteration might be different, but up to now the model and its application get only 2 cheers.

Fryer et al’s seminal study begins by illuminating the possibilities for enlightening health policy by means of the ecology model. Their research at the population level once again documents the 2 most critical elements required for a balanced health care system: access to a regular and dependable source of medical care, and adequate health insurance. What we urgently need now is more informative data about the perceived problems and the suffering of both individuals and populations and the limited degree to which the disgraceful distortions in America’s current health care arrangements addresses them. The late Bradford Hill, doyen of the field, often reminded us that health statistics should “represent people with the tears wiped off.”

Webster’s dictionary defines ecology as “the totality or pattern of relations between organisms and their environment.” Contemporary health statistics, however, uses a 17th century reductionist, biomedical, and money-based model that reifies diseases, has a mechanistic body-shop view of the human condition, and frequently employs defensive and inordinately expensive belt-and-suspenders approaches to diagnosis and intervention. Fryer et al have given us the who and the...
where associated with clinical events, now we need to
document the what, why, how, and result (outcome is
the fancy term) associated with each. In turn, these
measures should be amenable to aggregation by prob-
lems as well as by diseases, providers, institutions, and
the like.

For 2 centuries, ever more sophisticated disease-
labeling (nomenclatures) and classification systems as
embodied in the International Classification of Dis-
eases (ICD) evolved, often using terms derived from
Greek and Latin or the names of long-dead clinicians.
Undoubtedly, these systems have been useful. Now,
however, the College of American Pathologists enthu-
siastically promotes its Systematized Nomenclature
of Medicine (SNOMED) for use at the primary care
level,\(^6\) based, it would seem, on the assumption that
all health problems are manifestations of one sort or
another of reified “pathology.” The world view of
SNOMED does little to enable the task of document-
ing patients’ needs as expressed at the primary care
level, almost one half of which do not fit an orthodoxy
label at the initial encounter.\(^7\)

For the ecology model to justify 3 cheers, family
medicine needs to seize the initiative in promoting
nomenclature, classification, and information systems
that reflect the problems, needs, and heartfelt suffering
of individuals and populations and the care they seek
and receive. A major objective of these systems should
be to stimulate and empower politicians, the public,
managers, and health professionals to change many cur-
rently dysfunctional priorities, procedures, and practices.

For starters, the overall health information system
urgently requires a 21st century conceptual vision,
framework, or schema. Although some still use an
uncoordinated, or garbage can, model, most manufac-
turing and service industries, banks, and the military
usually have clear objectives for their information sys-
tems. Why not medicine? It is time for health informa-
tion and statistical systems to invoke George Engle’s
25-year-old biopsychosocial model by making the
patient’s experience and context the focus of nomen-
clatures and classifications.\(^8\)–\(^11\) The patient’s problem
should be the starting point, with subsequent interven-
tions and events related and modified by whatever
other labels are required. For example, a person or
someone close to that person perceives an imbalance
in a bodily or mental functioning or an emotional state
that is then expressed as a problem, symptom, com-
plaint, question, or even by body language. These
expressions constitute the language of disease; they
need to be recorded, observed, and followed through
the health care maze. Medicine’s contemporary disease
labels and codes can come later. You don’t have “it”
until a physician names “it”.

The International Classification of Primary Care,\(^12\)
available for almost 2 decades, is used widely in
Europe but much less so in the United States. Com-
puterized thesauruses can aggregate patients’ terms
into manageable doctor-speak language (ICD).\(^13\) In
addition, modifiers attached to the original sensation
could be recorded numerically with several levels each
of, for example, hurt, pain, severity, urgency, concern,
and anxiety. If, in the patient’s search for relief, home
remedies and over-the-counter pills and potions prove
inadequate, the patient might seek alternative or
orthodox medical services. Skilled, appropriate, and
compassionate care ensues when, without financial
impediment, a trusted general physician—a personal
doctor\(^14\) is accessible. There might follow consulta-
tions with specialists and superspecialists and admis-
tions to hospitals and other care modalities. To these
modalities can be attached sets of actual or estimated
costs for lost time at work (or school), baby sitters,
transportation, waiting time, useful and useless tests
and consultations, and finally for just and prompt pay-
ments to nurses, physicians, other caregivers, and insti-
tutions. Additional measures, although harder to come
by, could include the costs of wasteful, if not counter-
productive, third party administrative activities.

In summary, health information systems should
strive to trace the natural history of the search by indi-
viduals and populations for the resolution of their ini-
tial and continuing problems. The systems, including
nomenclatures and classifications, should start with
and primarily focus on patients and their problems.
Our current information systems, on the other hand,
although often event (ie, service) based, too often are
organized largely by money and by confirmed and
duly labeled diseases, they are oriented toward the
needs of accountants and physicians rather than the
needs of patients and the public.

At the immediately practical and operational
level, all surveys conducted by the National Center for
Health Statistics (NCHS), the Agency for Healthcare
Research and Quality (AHRQ), the Centers for
Medicare and Medicaid, and the Centers for Disease
Control and Prevention (CDC) should at least use
comparable terms, recall periods, and sampling stan-
dards. Their statistical systems should have the capacity
to analyze the relationships among measures of need
(problems, complaints, questions, etc), resources (per-
sonnel, organizations, institutions, etc), use (encoun-
ters, admissions, medicines, etc), and results (outcomes,
errors, compliance, etc) for defined populations.

Linking the National Health Interview Survey
(NHIS) and the MEPS is a sound start, and Fryer et al
have exploited it imaginatively. The National Ambula-

tory Medical Care Survey and many of the other NCHS
surveys need to be redesigned so that further linkages are possible. A recent MEPS analysis of asthma begins to show the value of such linkages.\textsuperscript{15} We could enhance our understanding of the essential importance of primary care, however, if the survey had started, for example, with the individual's initial episode of “difficulty breathing,” including appropriate modifiers, and was then linked to the first physician contact, emergency department visit, or hospital admission. Why not expand this approach by tracking 10 common problems brought to sources of primary care, such as chest pain, belly pain, headache, cough, rash, fever, insomnia, or depressions, for example? Population-based rates can then be generated. Is all this just fantasy?

No! The World Health Organization/International Collaborative Study of Medical Care Utilization (WHO/ICSMCU) used similar ideas involving household surveys in 12 study areas in 7 counties, each with 1,000 families, or about 5,000 persons, altogether about 60,000 individuals, with a response rate of at least 95% in each area.\textsuperscript{16-18} Tapani Purola, Professor of Social Policy at the University of Helsinki, created the model.\textsuperscript{18} In dozens of publications our international and interdisciplinary team produced crude and standardized rates per 1,000 population for a wide range of measures of need, such as “persons with perceived morbidity of high severity within 2 weeks” and “persons with chronicity and disability,” as well as for persons with several specific health problems. These measures were correlated with resource ratios for each study area, such as “physicians in clinical practice,” “general practitioners,” “nursing personnel,” and “short-term hospital beds,” and with rates for use, such as “persons with physician contacts within 2 weeks,” “volume of face-to-face physician contacts,” “volume of hospital nights,” and “volume of different prescribed medicines.”

Profiles created for each study area provided startling comparisons. Several areas, for example, had balanced arrangements reflected in measures of high need, high resources, and high use, but others were seriously unbalanced in diverse respects. One analysis of the WHO/ICSMCU data used a measure of pressure on the health care system: “persons with perceived morbidity of the highest degree of severity within 2 weeks who wanted to contact a physician for a health problem but did not obtain a contact.” There was a straight-line relationship across the 12 study areas between this variable and short-term hospital use. Where the standardized rate for unmet need at the ambulatory level was greatest, the rate for use of short-term hospital beds was also greatest, regardless of the bed-to-population ratios. Unmet need was a more important determinant of hospital use than the availability of beds.\textsuperscript{16,17}

Finally, I suggest that the NCHS should move from CDC to AHRQ. Such a move would permit ever closer integration, not only of the MEPS with the NHIS but also with many other surveys in the NCHS portfolio. Such a move could only strengthen both entities. The NCHS has much more in common with AHRQ than with CDC, which has its hands full coping with acute and chronic epidemics. These thoughts, stimulated by Fryer et al’s pioneering study, might seem subversive in some circles, but I believe that the advent of a new 21st century vision for health statistics and the institutional shift of NCHS to AHRQ would take us a long way toward justifying 3 cheers for ecology.

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