

als that support a longitudinal relationship basis for health care surely are important parts of the solution to inequalities in health and health care.<sup>12</sup> This relationship between primary care clinicians and their patients – continuity of care – will be a focus of the next issue of *Annals*.

To read commentaries or to post a response to this article, see the online version at <http://annfamned/cgi/content/full/11/2/66>.

## References

1. U.S. Preventive Services Task Force. Behavioral interventions to promote breastfeeding: recommendations and rationale. *Ann Fam Med* 2003;1:79-80.
2. Guise JM, Palda V, Westhoff C, et al. The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force. *Ann Fam Med* 2003;1:70-80.
3. Stange KC, Phillips WR. On TRACK. *Ann Fam Med* 2003;1:119-120.
4. Fryer GE Jr, Green LA, Dovey SM, Yawn BP, Phillips RL, Lanier D. Variation in the ecology of medical care. *Ann Fam Med* 2003;1:81-89.
5. Committee on Quality of Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21<sup>st</sup> Century*. Washington, DC: National Academy Press; 2001.
6. White KL. Two cheers for ecology. *Ann Fam Med* 2003;1:67-69.
7. Fiscella K, Franks P, Doescher MP, Saver BG. Do HMOs affect educational disparities in health care? *Ann Fam Med* 2003;1:90-96.
8. Strunk BC, Reschovsky JD. Kinder and gentler: physicians and managed care, 1997-2001. *Tracking Reports*. November, 2002. Washington: Center for Studying Health System Change; 2002.
9. Grumbach K; Hart GL; Mertz E, Coffman J, Palazzo L. Who is caring for the underserved: a comparison of primary care physicians and nonphysician clinicians in California and Washington. *Ann Fam Med* 2003;1:97-104.
10. Stevens GD, Shi L, Cooper LA. Patient-provider racial and ethnic concordance and parent reports of the primary care experiences of children. *Ann Fam Med* 2003;1:105-112.
11. Becker G. Cultural expressions of bodily awareness among chronically ill Filipino Americans. *Ann Fam Med* 2003;1:113-118.
12. Smedley BD, Stith AY, Nelson AR, eds. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: National Academies Press; 2003.

## EDITORIAL

# Two Cheers for Ecology

Kerr L. White, MD

*Ann Fam Med* 2003;1:67-69. DOI: 10.1370/afm.50.

*All models are wrong, some are useful.*  
Anonymous<sup>1</sup>

In this issue, Fryer and colleagues<sup>2</sup> set new standards and aspirations for health information.<sup>3</sup> 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 Horder<sup>3</sup> almost 50 years ago for their London practice. Previous applications<sup>4,5</sup> 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

### CORRESPONDING AUTHOR

Kerr L. White, MD  
250 Pantops Mountain Rd  
Charlottesville, VA 22911-8680  
klw2j@virginia.edu

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 problems 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 Diseases (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 enthusiastically promotes its Systematized Nomenclature of Medicine (SNOMED) for use at the primary care level,<sup>6</sup> 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 documenting patients' needs as expressed at the primary care level, almost one half of which do not fit an orthodox label at the initial encounter.<sup>7</sup>

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 currently 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 manufacturing and service industries, banks, and the military usually have clear objectives for their information systems. Why not medicine? It is time for health information and statistical systems to invoke George Engle's 25-year-old biopsychosocial model by making the patient's experience and context the focus of nomenclatures and classifications.<sup>8-11</sup> The patient's problem should be the starting point, with subsequent interventions 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, complaint, 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,<sup>12</sup> available for almost 2 decades, is used widely in Europe but much less so in the United States. Computerized thesauruses can aggregate patients' terms into manageable doctor-speak language (ICD).<sup>13</sup> 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<sup>14</sup> is accessible. There might follow consultations with specialists and superspecialists and admissions 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 payments to nurses, physicians, other caregivers, and institutions. Additional measures, although harder to come by, could include the costs of wasteful, if not counterproductive, third party administrative activities.

In summary, health information systems should strive to trace the natural history of the search by individuals and populations for the resolution of their initial 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 standards. Their statistical systems should have the capacity to analyze the relationships among measures of need (problems, complaints, questions, etc), resources (personnel, organizations, institutions, etc), use (encounters, 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 Ambulatory 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.<sup>15</sup> We could enhance greatly 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.<sup>16-18</sup> Tapani Purola, Professor of Social Policy at the University of Helsinki, created the model.<sup>18</sup> 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.<sup>16,17</sup>

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.

To read commentaries or to post a response to this article, see the online version at <http://annfamned/cgi/content/full/11/2/67>.

Received May 5, 2003; accepted May 7, 2003.

## References

- Sweeney K, Griffiths F. *Complexity and Healthcare: An Introduction*. Abingdon, England: Radcliffe Medical Press; 2002.
- Fryer, GE, Green LA, Dovey SM, Yawn BP, Phillips RL, Lanier D. Variations in the ecology of medical care. *Ann Fam Med* 2003;1:81-89.
- Horder J, Horder E. Illness in general practice. *Practitioner* 1954; 173:177-187.
- White KL, Williams TF, Greenberg BG. The ecology of medical care. *N Engl J Med* 1961;265:885-892.
- Green LA, Fryer GE, Yawn BP, Lanier D, Dovey SM. The ecology of medical care revisited. *N Engl J Med* 2001;344:2021-2025.
- Systemized Nomenclature of Medicine. Available at: <http://www.snomed.org>. Accessed April 18, 2003.
- College of General Practitioners, Records and Statistical Unit. Disease labels. *J Coll Gen Pract* 1963;6:197.
- Engle G. The need for a new medical model: A challenge for biomedicine. *Science* 1977;196:129-136.
- Pauli H, White KL, McWhinney IR. Medical education, research, and scientific thinking in the 21st century. *Educ Health* 2000;13(1):15-25.
- Pauli H, White KL, McWhinney IR. Medical education, research, and scientific thinking in the 21st century. *Educ Health* 2000;13(2):165-172, 173-186.
- Foss L. *The End of Modern Medicine: Biomedical Science Under a Microscope*. New York, NY: New York State University Press; 2002.
- Wood M, Lamberts H. *International Classification of Primary Care*. Oxford, England: Oxford University Press; 1987.
- Lamberts H, Wood M, Hofmans-Okkes IM, eds. *The International Classification of Primary Care in the European Community*. Oxford, England: Oxford University Press; 1993.
- Fox TF. The personal doctor and his relation to the hospital. *Lancet* 1960;1:743-760.
- Agency for Healthcare Research and Quality. *Statistical Brief #13: Asthma Treatment: Use of Medications and Devices, 2000*. Available at: <http://www.meps.ahrq.gov/papers/st13/stat13.htm>. Accessed April 2003.
- White KL, Anderson D, Kalimo E, Kleczkowski BM, Purola T, Vukmanovic C. *Health Services: Concepts and Information for National Health Planning and Management*. Public Health Papers No. 67. Geneva, Switzerland: World Health Organization; 1977.
- Kohn R, White KL. *Health Care: An International Study*. Oxford, England: Oxford University Press; 1976.
- Purola T. A systems approach to health and health policy. *Med Care* 1972;10:373-379.