

4. Tanizaki Y, Kiyohara Y, Kato I, et al. Incidence and risk factors for subtypes of cerebral infarction in a general population: the Hisayama study. *Stroke*. 2000; 31(11):2616-2622.
5. Psaty BM, Manolio TA, Kuller LH, et al. Incidence of and risk factors for atrial fibrillation in older adults. *Circulation*. 1997;96(7):2455-2461.
6. Annoura M, Ogawa M, Kumagai K, Zhang B, Saku K, Arakawa K. Cholesterol paradox in patients with paroxysmal atrial fibrillation. *Cardiology*. 1999; 92(1):21-27.
7. Iguchi Y, Kimura K, Shibazaki K, et al. Annual incidence of atrial fibrillation and related factors in adults. *Am J Cardiol*. 2010;106(8):1129-1133.
8. Nielsen FH, Milne DB, Klevay LM, Gallagher S, Johnson L. Dietary magnesium deficiency induces heart rhythm changes, impairs glucose tolerance, and decreases serum cholesterol in postmenopausal women. *J Am Coll Nutr*. 2007; 26(2):121-132.
9. Ohira T, Peacock JM, Iso H, Chambless LE, Rosamond WD, Folsom AR. Serum and dietary magnesium and risk of ischemic stroke: the Atherosclerosis Risk in Communities Study. *Am J Epidemiol*. 2009;169(12):1437-1444.

## COMMENTS AND OPINIONS

### Dietary Fiber Prevents Both Morbidity and Mortality From Respiratory Disease

We read with interest the recent finding by Park et al<sup>1</sup> that dietary fiber was associated with a 69% and 54% lower risk of death from respiratory diseases among men and women, respectively, using data from the National Institutes of Health (NIH)-AARP prospective cohort. As indicated by the authors, anti-inflammatory properties of dietary fiber may contribute to the observed associations. Summarized

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herein are previously reported findings from 2 prospective cohorts, the Singapore Chinese Health Study (SCHS)<sup>2</sup> and the US Atherosclerosis Risk in Communities (ARIC) study,<sup>3</sup> that support a beneficial effect of higher fiber intake in the development of respiratory morbidity.

In the SCHS, among 49 140 older adults, dietary fiber intake was inversely associated with incident cough with phlegm in a dose-dependent manner (adjusted odds ratio, 0.61 [95% confidence interval, 0.47-0.78], comparing highest to lowest quartile of intake; *P* value for trend, <.001).<sup>2</sup> In the ARIC study, higher fiber intake was significantly associated with better lung function (higher FEV<sub>1</sub> [forced expiratory volume in 1 second], FVC [forced vital capacity], and FEV<sub>1</sub>/FVC).<sup>3</sup> For example, FEV<sub>1</sub> was 49 mL higher in the highest compared with the lowest quintile of cereal fiber intake (*P* value for trend, <.001). Higher cereal fiber intake was also related to lower prevalence of chronic obstructive pulmonary disease defined by spirometry (adjusted odds ratio, 0.79 [95% confidence interval, 0.64-0.98], comparing highest to lowest quintile of intake; *P* value for trend, .017).

In summary, previous prospective data from the SCHS and the ARIC study along with recent findings from the NIH-AARP study collectively support a beneficial effect of a diet high in fiber in preventing both morbidity and mortality from respiratory disease.

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1. Park Y, Subar AF, Hollenbeck A, Schatzkin A. Dietary fiber intake and mortality in the NIH-AARP Diet and Health Study [published online February 14, 2011]. *Arch Intern Med*. 2011;171(12):1061-1068.
2. Butler LM, Koh WP, Lee HP, Yu MC, London SJ. Dietary fiber and reduced cough with phlegm: a cohort study in Singapore. *Am J Respir Crit Care Med*. 2004;170(3):279-287.
3. Kan H, Stevens J, Heiss G, Rose KM, London SJ. Dietary fiber, lung function, and chronic obstructive pulmonary disease in the atherosclerosis risk in communities study. *Am J Epidemiol*. 2008;167(5):570-578.

### Number Needed to Treat: Implementation for Diets

Park et al concluded their study by stating that “A diet rich in dietary fiber may provide significant health benefit.”<sup>1(pE7)</sup> Crowe et al<sup>2</sup> recently reported their observations of the 519 978 men and women from the 10 European countries collaborating in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort. They concluded in this large series that “participants consuming at least eight portions (80 g each) of fruits and vegetables a day had a 22% lower risk of fatal ischemic heart disease (IHD) compared with those consuming fewer than three portions a day.”<sup>2</sup>

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Considering the data provided by Crowe et al,<sup>2</sup> one can calculate that the number needed to treat to avoid 1 death from IHD during 8.4 years is 500 (6.7 deaths per 1000 persons consuming <3 portions of fruits and vegetables per day vs 4.7 deaths per 1000 persons consuming 8 portions per day).<sup>2</sup> One can also observe that, in 10 European countries, smoking behavior (addiction to tobacco, the first cause of both cancer and IHD) was more frequent than eating at least 8 portions of fruits and vegetables a day (24% vs 18%, respectively).

Public health strategies must first target the proven cost-effective measures to fight tobacco dealers and to help smokers to quit. The possible relation between fruit and vegetable consumption with IHD mortality is characterized by uncertainty. Moreover, adequate policies are still being sought for feasible long-term and even short-term populationwide changes in diet.

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1. Park Y, Subar AF, Hollenbeck A, Schatzkin A. Dietary fiber intake and mortality in the NIH-AARP Diet and Health Study [published online February 14, 2011]. *Arch Intern Med*. 2011;171(12):1061-1068.
2. Crowe FL, Roddam AW, Key TJ, et al; European Prospective Investigation into Cancer and Nutrition (EPIC)-Heart Study Collaborators. Fruit and vegetable intake and mortality from ischaemic heart disease: results from the European Prospective Investigation into Cancer and Nutrition (EPIC)-Heart study [published online January 18, 2011]. *Eur Heart J*. doi:10.1093/eurheartj/ehq465.

## HEALTH CARE REFORM

### More Health Care Is Not Necessarily Better Health Care

**K**ullgren et al<sup>1</sup> show that low-income families with high-deductible health plans report cost-related delayed or foregone care. However, the authors fail to show that the additional care consumed by the higher-income group was essential or that outcomes were superior in that group.

In the well-known RAND study of free medical care vs cost sharing,<sup>2</sup> the cost sharing group had one-third fewer ambulatory visits and one-third fewer hospitalizations than the free-care group, and yet there was no difference in health measures between either group for the average patient except for a trivial difference in corrected vision of 20/22 vs 20/22.5. In the subgroup of low-income high-risk patients, there was a significant 3.3 mm Hg difference in diastolic blood pressure, but there was no difference in smoking, weight, cholesterol level, or any of 5 self-assessed measures of health.

In 1984, the Stanford health care economist Victor Fuchs estimated that 20% of all medical care was either harmful or low yield.<sup>3</sup> Without evidence that the deferred care in the Kullgren study resulted in poorer outcomes, it is reasonable to posit that much excess care is either harmful or low yield and that the deferral of care was rational from a personal cost-benefit point of view.

The value of any particular episode of care is situational and personal, and so decisions on what medical care to buy are best made at the level of patient and physician. If, however, Kullgren et al are correct in their observation of income-based health care utilization disparity, then leveling of the playing field between lower- and higher-income families could be accomplished with income-based progressive copayments, so that *all* patients may consider cost to benefit in their choices. Innovations of this type are a first and essential step toward rationalizing care, without the kind of 1 size fits all, top-down rationing that is on the minds of many.

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1. Kullgren JT, Galbraith AA, Hinrichsen VL, et al. Health care use and decision making among lower-income families in high-deductible health plans. *Arch Intern Med*. 2010;170(21):1918-1925.
2. Brook RH, Ware JE Jr, Rogers WH, et al. Does free care improve adults' health? Results from a randomized controlled trial. *N Engl J Med*. 1983;309:1426-1434.
3. Fuchs VR. The "rationing" of medical care. *N Engl J Med*. 1984;311(24):1572-1573.

### In reply

Dr Erlebacher identifies an important limitation of our study. Our survey found that lower-income families reported higher rates of delayed or foregone care due to cost. The study design did not enable us to determine how essential the delayed or foregone services may have been.

Previous studies suggest that cost-sharing affects both essential and less-essential care. The RAND Health Insurance Experiment referenced by Dr Erlebacher showed that patients exposed to high levels of cost sharing reduced their use of highly-effective care and less-effective care in similar proportions.<sup>1,2</sup> A more recent study by Hibbard et al<sup>3</sup> found that new enrollees in a consumer-directed health plan (CDHP) reduced their use of high-priority office visits as often as their use of low-priority office visits.

Both of these studies found that high levels of cost sharing had important consequences for lower-income patients. In the RAND study, the higher blood pressures among lower-income hypertensive patients in plans with cost sharing led to a 10% increase in mortality compared with those with free care. Lower-income patients in the cost-sharing plans were less likely to have received needed dental care and were more likely to have experienced serious symptoms like dyspnea on exertion, chest pain while exercising, or loss of consciousness compared with those who had free care. In the study by Hibbard et al,<sup>3</sup> lower-income patients reduced their use of high-priority office visits during their first year in a CDHP more than higher-income patients did.

We agree that decisions about services with out-of-pocket costs are best made between patients and their physicians and that innovation in insurance benefit design offers important opportunities to limit the burden of out-of-pocket costs for low-income families while promoting the use of high-value care.

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1. Newhouse JP. *Free for All? lessons from the RAND Health Insurance Experiment*. Cambridge, MA: Harvard University Press; 1993.
2. The Health Insurance Experiment. *A Classic RAND Study Speaks to the Current Health Care Reform Debate*. Santa Monica, CA: RAND Health; 2006.
3. Hibbard JH, Greene J, Tusler M. Does enrollment in a CDHP stimulate cost-effective utilization? *Med Care Res Rev*. 2008;65(4):437-449.