

mood disorders associated with substances such as alcohol and other drugs, as well as those associated with physical illness and injury, they did not indicate that the CIDI also excludes data from those respondents who consider their symptoms to be trivial or who have not consulted a physician; those who report that their symptoms do not interfere “a lot” with their everyday life and activity (as determined by the respondent); and those who have not taken medication for their symptoms on more than 1 occasion.

The exclusion of those respondents whose depressive disorder is associated with alcohol and/or drugs, or with concomitant physical illness and injury, while consistent with the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* guidelines, would result in an appreciable underestimate of mood disorders, as would the exclusion of those respondents who sought treatment but who had not taken medication more than once. The CIDI even excludes pregnancy, considering it a “physical condition that can cause symptoms.”<sup>3</sup> The exclusion of those respondents who considered their symptoms to be trivial risks the omission of those who deny the significance of their symptoms and who have poor mental health literacy. Each of these exclusion criteria is open to interpretation.

Robert D. Goldney, MD  
robert.goldney@adelaide.edu.au

Laura J. Fisher, BA  
Department of Psychiatry  
University of Adelaide  
The Adelaide Clinic  
Gilberton, South Australia

Graeme Hawthorne, PhD  
Department of Psychiatry  
Australian Centre for Posttraumatic Mental Health  
University of Melbourne  
Melbourne, Victoria

1. The WHO World Mental Health Consortium, World Health Organization. Prevalence, severity and unmet need for the treatment of mental disorders in the World Health Organization World Mental Health Surveys. *JAMA*. 2004;291:2581-2590.

2. Robins LN, Wing J, Wittchen HU, et al. The Composite International Diagnostic Interview: an epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Arch Gen Psychiatry*. 1988;45:1069-1077.

3. World Health Organization. *Composite International Diagnostic Interview, Version 2.1*. Geneva, Switzerland: World Health Organization; 1996.

**In Reply:** Dr Goldney and colleagues are incorrect in their characterization of the WMH-CIDI clinical significance exclusion rules. The exclusions they are concerned about (participants who considered their symptoms trivial, did not consult a physician, said their symptoms did not interfere with their life “a lot,” and did not take medication for symptoms more than once) apply only to the original CIDI.<sup>1</sup> The more recent WMH-CIDI,<sup>2</sup> which was used in the WMH surveys, includes much more extensive questioning about distress and impairment. Goldney and colleagues are also incorrect in their description of the WMH-CIDI organic exclusion rules. Rather than the simple decision rules they describe, the WMH-CIDI collects open-ended data on comorbid medi-

cal disorders and uses case-by-case psychiatrist review to make individual exclusion decisions. Pregnancy is not a basis for exclusion.

We validated the WMH-CIDI with trained psychiatrists who recontacted subsamples of respondents and blindly administered a clinical research diagnostic interview. Good validity was found for most diagnoses. However, not all people with mental disorders are more willing to disclose their disorder to a psychiatrist than to a lay interviewer, and others lack insight into their conditions and are unable to report symptoms such as paranoid ideation or excessive worry, because they do not perceive them to exist. These are challenging problems in making accurate diagnoses even for experienced clinicians. As a result, despite WMH-CIDI prevalence estimates being comparable with clinical estimates, we recognize that both estimates are likely to be downwardly biased, making it all the more striking that the WMH surveys documented high prevalence of mental disorders in the vast majority of countries. We acknowledged this potential bias in our article, and we continue to carry out research to reduce these methodological problems, with a special focus on less developed countries.

Ronald C. Kessler, PhD  
Kessler@hcp.med.harvard  
Harvard Medical School  
Boston, Mass

T. Bedirhan Ustun, MD  
World Health Organization  
Geneva, Switzerland

1. Robins LN, Wing J, Wittchen HU, et al. The Composite International Diagnostic Interview: an epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Arch Gen Psychiatry*. 1988;45:1069-1077.

2. Kessler RC, Ustun TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res*. 2004;13:93-121.

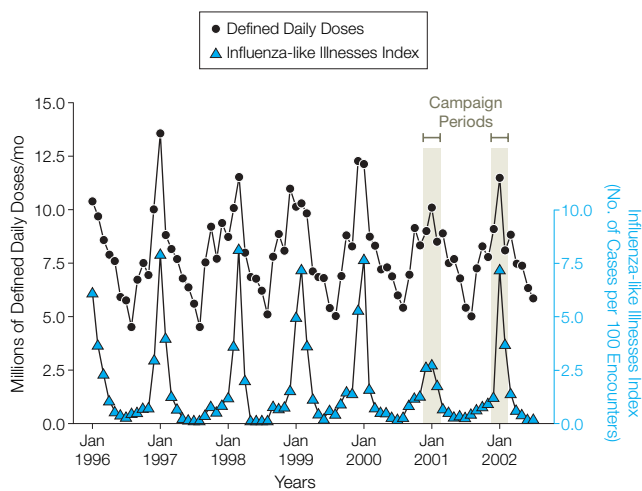
## RESEARCH LETTER

### Association Between Antibiotic Sales and Public Campaigns for Their Appropriate Use

**To the Editor:** Two public campaigns for more rational use of antibiotics were organized in Belgium in 2000-2001 and 2001-2002 with a goal of reducing overuse and misuse of antibiotics in the community. We assessed their effectiveness with a time-series analysis that examined changes in antibiotic sales, accounting for the confounding effect of the seasonal variation of influenza-like illnesses (ILIs).

**Methods.** Each 3-month campaign concentrated on simple messages, together with a series of specific answers on topics of interest, that were conveyed through booklets, handouts, posters, prime-time television spots, and Web sites.<sup>1</sup> Examples included “Use antibiotics less frequently but better”; “Save antibiotics, they may save your life”; and “Talk to your Doctor, Talk to your Pharmacist.” Monthly outpatient antibiotic use in the community was estimated for the 1996-

**Figure 1.** Seasonal Variation of Monthly Outpatient Antibiotic Sales and of Monthly Indices of Influenza-like Illnesses in Belgium, January 1996-July 2002



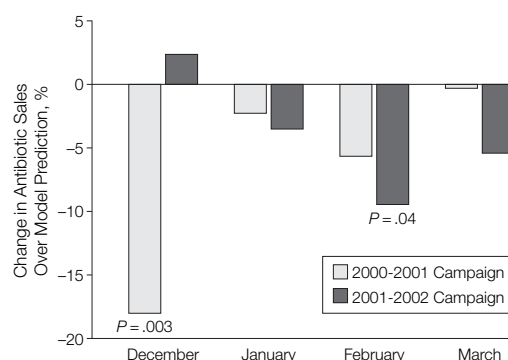
2002 period by extrapolation from sales data that covered 80.1% of all community pharmacies and 76.1% of the population. Sales data were converted to defined daily doses (DDDs).<sup>2</sup> This unit is the assumed average maintenance dose per day for a drug used in adults for its main indication as defined by the World Health Organization; it allows for direct comparisons of drug use over time and place. National yearly gross antibiotic sales data were obtained from Intercontinental Marketing Services (IMS-Health) over the 1996-2002 period. In Belgium, antibiotics are available by prescription only.

Influenza-like illness was defined as flu-like symptoms: fever, myalgia, and respiratory symptoms, with sudden onset. Monthly indices of ILIs over the 1996-2002 periods were provided by the Belgian Scientific Institute of Public Health.<sup>3</sup> To control for the seasonal influence of ILIs, an ARIMA transfer function model<sup>4</sup> was built, with the output variable corresponding to antibiotic sales data (in DDDs), and the input variables corresponding to the ILI index and 2 intervention variables (1 for each campaign).

**Results.** Total antibiotic sales decreased 11.7% and 9.6% (in DDDs) during the 2000-2001 and the 2001-2002 December-March periods, respectively, compared with the same months in 1999-2000. However, there was an upsurge of antibiotic consumption with each seasonal peak of ILI index across the entire 1996-2002 period (Pearson correlation coefficient, 0.81;  $P < .01$  [2-tailed]), and the 2000-2001 winter campaign period had a relatively low ILI index (FIGURE 1). The sales variation due to ILI amounted to 447 459 (SD, 38 950) DDDs per unit of ILI index.

After controlling for the influence of ILI, the global reduction in antibiotic sales for the 2000-2001 and the 2001-2002 campaigns periods was 6.5% ( $P < .05$ ) and 3.4% (NS), respectively (FIGURE 2). Both campaigns had their maximal effect at the time of the peak of ILI. Data from IMS-

**Figure 2.** Monthly Change in Antibiotic Sales Controlled for Influenza-like Illnesses During Each Campaign (December-February) and the Following Month (March)



Residual seasonal autoregressive terms: lag period, 12 months; estimated coefficient: 0.83 [SE, 0.06]; constant: 7459075 (SD, 431387) defined daily doses/mo. The  $P$  values are indicated for the months and campaigns for which the changes were statistically significant.

Health (uncorrected for seasonal variations of ILI) showed a yearly antibiotic sales decrease of 5.3% (in DDDs) between 2000 and 2002, in contrast to a 2.9% increase for the 1997-1999 period. The 2 campaign periods were associated with an overall decrease of 1 354 518 (SD, 449 646) and of 1 195 290 (SD, 592 072) DDDs, respectively.

**Comment.** The level of antibiotic resistance of typical human pathogens is correlated with the rate of antibiotic use in the community.<sup>5</sup> Overuse and misuse of antibiotics in the outpatient setting is commonly observed in countries or communities where consumption is great,<sup>6</sup> and Belgians are among the high consumers in Europe.<sup>7</sup> The present study shows that antibiotic sales are strongly linked to the incidence of ILI, for which the systematic use of antibiotics is not indicated in the general population. Our campaigns were associated with a reduction of antibiotic sales beyond what would merely result from interyear differences in the incidence of ILI. Public campaigns, therefore, may constitute a useful complement to other actions aimed at reducing antibiotic overconsumption. It remains to be seen, however, whether a reduction of antibiotic sales of the magnitude observed will help to curb the steady increase in resistance of pathogens in the community.

Isabelle Bauraind, MD†  
Federal Public Service for Health Security  
of the Food Chain and Environment  
Brussels, Belgium

José-Maria Lopez-Lozano, MD  
Unit of Preventive Medicine  
Hospital Vega Baja  
Orihuela, Alicante, Spain

Arielle Beyaert, PhD  
Department of Quantitative Methods for Economics  
Universidad de Murcia  
Murcia, Spain

Jean-Louis Marchal, PhD  
 Bruno Seys, MD  
 Belgian Institute of Pharmaco-epidemiology  
 Brussels, Belgium

Fernande Yane, MD  
 Erik Hendrickx, MD  
 Scientific Institute of Public Health  
 Brussels, Belgium

Herman Goossens, MD, PhD  
 Laboratory of Microbiology  
 Universiteit Antwerpen  
 Antwerp, Belgium

Paul M. Tulkens, MD, PhD  
 tulkens@facm.ucl.ac.be  
 Cellular and Molecular Pharmacology Unit  
 Université Catholique de Louvain  
 Brussels, Belgium

Ludo Verbist, MD, PhD  
 Laboratory of Microbiology  
 University Hospital  
 Katholieke Universiteit Leuven  
 Louvain, Belgium

†Deceased.

Drs Bauraind, Hendrickx, Goossens, Tulkens, and Verbist are members of the Belgian Antibiotic Policy Coordination Committee (BAPCOC).

**Funding/Support:** The BAPCOC undertook the campaigns with the support of the Federal Services of Public Health and of Social Affairs, and the French, Flemish and German Communities of Belgium. IMS-Health Belgium kindly provided us with gross sales data of antibiotics in Belgium for the 1996-2003 period.

**Role of the Sponsor:** All direct costs of the campaigns were paid by the Ministry of Social Affairs (present denomination: Public Federal Service for Social Security

and Public Institutions of Social Security). Scientific help was provided through the specialized institutions of the Belgian State as needed. The final organization of the campaigns and their evaluation was done by the ad hoc workgroup of the BAPCOC.

1. Belgian National Campaign for Appropriate Use of Antibiotics Web site. Available at: <http://www.antibiotiques.org>. Accessed September 30, 2004.
2. WHO Collaborating Centre for Drug Statistics Methodology Web site. Available at: <http://www.whocc.no/atcddd/>. Accessed September 30, 2004.
3. Snacken R, Lion J, Van Casteren V, et al. Five years of sentinel surveillance of acute respiratory infections (1985-1990): the benefits of an influenza early warning system. *Eur J Epidemiol*. 1992;8:485-490.
4. Pankratz A. *Forecasting With Dynamic Regression Models*. New York, NY: Wiley; 1991.
5. Bronzwaer SL, Cars O, Buchholz U, et al. A European study on the relationship between antimicrobial use and antimicrobial resistance. *Emerg Infect Dis*. 2002;8:278-282.
6. Hooton TM, Levy SB. Antimicrobial resistance: a plan of action for community practice. *Am Fam Physician*. 2001;63:1087-1098.
7. Cars O, Molstad S, Melander A. Variation in antibiotic use in the European Union. *Lancet*. 2001;357:1851-1853.

## CORRECTIONS

**Incorrect Wording:** In the Original Contribution entitled "Vaccination Success Rate and Reaction Profile With Diluted and Undiluted Smallpox Vaccine: A Randomized Controlled Trial" published in the September 8, 2004, issue of THE JOURNAL (2004;292:1205-1212), there was incorrect wording in a sentence. On page 1206, under Vaccine Specifics, the third sentence should read ". . . pock forming units per milliliter . . ." instead of ". . . plaque forming units per milliliter . . ."

**Financial Disclosure Omitted:** In the Preliminary Communication entitled "Repetitive Bilateral Arm Training and Motor Cortex Activation in Chronic Stroke" published in the October 20, 2004, issue of JAMA (2004;292:1853-1861), a financial disclosure was omitted. Drs McCombe-Waller and Whital are named as inventors on a patent application for the bilateral arm trainer. The patent will be held by the University of Maryland but not by the authors.

### Call for Submissions: Archives of Internal Medicine

The editors of the *Archives of Internal Medicine* seek artistic photographs or photographs of artwork done by *Archives* readers for reproduction on the journal's cover. Submissions must be the author's own work; work that has to do with the themes of medicine is of particular interest. Sculpture, paintings, drawings, photography, fabric art, graphic art, metalwork, crafts, computer art, depictions of medical specimens—perhaps herbs or historical artifacts—and other forms of art are acceptable as long as they can be captured in a photographic submission. No recognizable persons should appear in the image. The image may be black and white or color and at least 3.5 × 5 in (7.6 × 12.7 cm) and no larger than 8 × 10 in (20.3 × 25.4 cm). Digital photographs may be submitted via the *Archives'* Web site (<http://www.archinternmed.com>). Text of fewer than 250 words written by the artist about the work should accompany submissions.