

UC Irvine

UC Irvine Previously Published Works

Title

Humans and models: converging 'truths'

Permalink

<https://escholarship.org/uc/item/3m40m5b3>

Journal

International Journal of Epidemiology, 41(1)

ISSN

1464-3685

Authors

Bruckner, Tim A
Margerison-Zilko, Claire

Publication Date

2011-12-05

Peer reviewed

rejected. To inspire his followers, Morris had attached his two exceedingly long and aggressive reviews of our paper (12 858 words and 5291 words, respectively), calling for critical letters in abundance to the *IJE* editors. Breaking unwritten confidentiality and courtesy rules of the peer-review process, Morris distributed his slandering criticism of our study to people working for the same cause. Rather than resorting to such selective distribution among friends, Morris should make both reviews freely available on the internet by posting them in their entirety on his pro circumcision homepage (www.circinfo.net). Alternatively, interested readers should feel free to request them from me at the e-mail address above.

Despite poorly founded criticisms and attempts at obstruction our findings suggest that male circumcision may be associated with hitherto unappreciated negative sexual consequences in a non-trivial proportion of men and women. Further carefully conducted studies are needed.

References

- ¹ Morris BJ. Why circumcision is a biomedical imperative for the 21st century. *Bioessays* 2007;**29**:1147–58.
- ² Perneger TV. What's wrong with Bonferroni adjustments. *Br Med J* 1998;**316**:1236–38.
- ³ Barros AJ, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. *BMC Med Res Methodol* 2003;**3**:21.
- ⁴ Krieger JN, Mehta SD, Bailey RC *et al*. Adult male circumcision: effects on sexual function and sexual satisfaction in Kisumu, Kenya. *J Sex Med* 2008;**5**:2610–22.
- ⁵ Kigozi G, Watya S, Polis CB *et al*. The effect of male circumcision on sexual satisfaction and function, results from a randomized trial of male circumcision for human immunodeficiency virus prevention, Rakai, Uganda. *BJU Int* 2008;**101**:65–70.
- ⁶ Circleleaks.http://circleleaks.org/index.php?title=Brian_Morris (8 August 2011, date last accessed).
- ⁷ Circleleaks.http://circleleaks.org/index.php?title=Jake_H._Waskett (8 August 2011, date last accessed).
- ⁸ Morris BJ. Renin, genes, and beyond: 40 years of molecular discoveries in the hypertension field. *Hypertension* 2011;**57**:538–48.
- ⁹ YouTube.<http://www.youtube.com/v/7yDvL4hNny4> (8 August 2011, date last accessed).
- ¹⁰ Morris BJ, Wodak A. Circumcision survey misleading. *Aust N Z J Public Health* 2010;**34**:636–37.
- ¹¹ Waskett JH, Morris BJ, Weiss HA. Errors in meta-analysis by Van Howe. *Int J STD AIDS* 2009;**20**:216–18.
- ¹² Waskett JH, Morris BJ. Fine-touch pressure thresholds in the adult penis. *BJU Int* 2007;**99**:1551–52.

doi:10.1093/ije/dyr181

Advance Access publication 28 November 2011

© The Author 2011; all rights reserved.

Humans and models: converging ‘truths’

From TIM A BRUCKNER^{1*} and CLAIRE MARGERISON-ZILKO²

¹Program in Public Health & Department of Planning, Policy, and Design, University of California, Irvine, CA, USA and

²Population Research Center & Center for Social Work Research, University of Texas, Austin, TX, USA

*Corresponding author. Program in Public Health & Department of Planning, Policy, and Design, University of California, 202 Social Ecology I, Irvine, CA, 92697, USA. E-mail: tim.bruckner@uci.edu

We thank Jay Kaufman for his thoughtful commentary¹ regarding our recent manuscript in which we reported a positive relation between acute income gains and accidental deaths among Cherokee Indians in rural North Carolina.² Although we agree with many of Kaufman's points, we would like to respond to a key question that holds relevance to most analyses using time series data: how should epidemiologists approximate the counterfactual value of a population exposed at a specific point in time?

One approach to deriving counterfactual values in time involves using a model-based framework. In our analysis of the Cherokee response to acute and large cash disbursements from a local Casino, we employed a Poisson regression with a conventional log-linear functional form.³ To control for confounding by temporal patterns in accidental deaths (e.g.

seasonality), we included indicator variables for calendar months and years. Identification of an effect of the Casino payments on accidental deaths, therefore, relies on a systematic deviation—in the 20 exposed months of the Casino disbursements—above expected values derived from the specific underlying (multiplicative) functional form of accidental deaths. The analyst, of course, could impose different model-based assumptions regarding temporality of accidental deaths (e.g. additivity), yet Kaufman notes the problem of insufficient statistical power to test such assumptions. In other words, the analyst has limited ability to detect what we call ‘wrong model bias’ in the functional form of a time series.

An alternative approximation of the counterfactual value, which Kaufman suggests, involves using a comparison series of accidental deaths among

non-Cherokee presumed to be unexposed to the Casino cash disbursement. Use of this control group, Kaufman reasons, could ‘difference’ out any seasonal, annual or other local temporal pattern that occurs generally across the Cherokee and non-Cherokee population but is not caused by the acute income shock. We, however, remain skeptical that non-Cherokee living on the reservation were unaffected by the large Casino disbursements. Literature in economics finds local ‘spillover’ effects of income shocks such that local non-Cherokee residents may stand to gain from increased income levels and spending in a community.⁴ Non-Cherokee youth also may engage in heightened risk taking with Cherokee through, for example, shared vehicular travel or consumption of alcohol and other drugs in social settings. Taken together, these circumstances raise the possibility that using accidental deaths of non-Cherokee in the local region as the counterfactual (comparison) rate for the Cherokee may inadvertently control for the Casino effect we seek to quantify.

Despite the inherent limitations of these options, we agree that the ability to detect a positive relation across multiple approaches reduces the threat of spurious results. Per Kaufman’s request, therefore, we repeated our analysis using the population of non-Cherokee in the region as a control group. The relative risk of accidental deaths for the Cherokee during months of the Casino payment was 2.39 [95% confidence interval (CI) 1.34–4.38]; findings remained quite similar when we used accidental deaths in all other North Carolina counties as a control series

(relative risk = 2.39; 95% CI 1.38–4.13). In this case, the ‘truths’—as told by the Cherokee interviewed in our study and as estimated by various regression models—appear to converge.

Funding

This work was supported by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD R21HD056581) and administered through the University of California, Berkeley Population Center.

References

- ¹ Kaufman JS. Commentary: Money and models: double-edged swords. *Int J Epidemiol* 2011;**40**:1091–93.
- ² Bruckner TA, Brown RA, Margerison-Zilko C. Positive income shocks and accidental deaths among Cherokee Indians: a natural experiment. *Int J Epidemiol* 2011;**40**:1083–90.
- ³ Breslow N. Tests of hypotheses in overdispersed Poisson regression and other quasi-likelihood models. *JASA* 1990;**85**:565–71.
- ⁴ Angelucci M, De Giorgi G. Indirect effects of an aid program: how do cash transfers affect ineligibles’ consumption? *American Econ Rev* 2009;**99**:486–508.

doi:10.1093/ije/dyr196

Advance Access publication 5 December 2011

© The Author 2011; all rights reserved.

Essay Review: Epidemiology and the people’s health. Theory and context. (review by Anthony J. McMichael of Nancy Krieger’s book of that title)

From RAJ S BHOPAL

Bruce and John Usher Professor of Public Health, Edinburgh Ethnicity and Health Research Group, Centre for Population Health Sciences, University of Edinburgh, Teviot Place, Edinburgh EH8 9AG, UK. E-mail: Raj.Bhopal@ED.ac.uk

As McMichael points out in his thought-provoking review¹ of Nancy Krieger’s important new book,² making the theory of epidemiology explicit has not been a high priority for our discipline. In this respect, epidemiology seems to be similar to other sciences, where the fundamental paradigms (including theory) are taken for granted, and where the principles relating to the science are largely to be found in textbooks.^{3,4} McMichael and Nancy Krieger both conclude that a single epidemiological theory of disease causation is unlikely to be achievable, but several theories may be needed—in McMichael’s words: ‘There seems to be a centrifugal tendency; no single

unifying theory will emerge.’ Is this, however, the pertinent question?

A theory of disease causation is a challenge for medicine and public health (and other health disciplines) but is it a central challenge for epidemiology? I think not. Epidemiology is, simply put, the study of the pattern of diseases in populations, and the causes and consequences of such patterns.⁵ If we accept this, the central question for epidemiological theory is what causes such patterns, in general, to arise? Theories relating to specific patterns for specific diseases and health outcomes are, primarily, the concern of other disciplines.