Approved by the Regents
May 18, 2017

PROMOTION RECOMMENDATION
The University of Michigan
School of Public Health
Department of Epidemiology

Sara D. Adar, assistant professor of epidemiology, Department of Epidemiology, School of Public Health, is recommended for promotion to associate professor of epidemiology, with tenure, Department of Epidemiology, School of Public Health.

Academic Degrees:

Ph.D.	2005	Harvard School of Public Health, Boston, MA
M.H.Sc.	1998	Johns Hopkins School of Public Health, Baltimore, MD
B.S.	1996	Massachusetts Institute of Technology, Cambridge, MA

Professional Record:

2011 – Present	Assistant Professor, Department of Epidemiology, School of Public Health, University of Michigan and John G. Searle Assistant Professor of Public Health, School of Public Health, University of Michigan
2010 – 2011	Research Assistant Professor, Department of Epidemiology, School of Public Health, University of Michigan
2008 – 2009	Assistant Professor, Department of Epidemiology and Department of Environmental and Occupational Health Sciences (April 2009), University of Washington School of Public Health
2005 – 2008	Senior Fellow, Department of Environmental and Occupational Health Sciences, University of Washington School of Public Health
1998 – 2001	Senior Associate, ENVIRON International, Risk Assessment Group
1997	Environmental Scientist, United States Environmental Protection Agency

Summary of Evaluation:

Teaching: Professor Adar's teaching is exemplary as evident from her teaching evaluations. She has taught two core courses for our MPH curriculum since she became an instructional track faculty member of our department, which is unique for a junior faculty member. The first course, SAS for Epidemiological Research, consistently has 90+ students. Given this class size, it is extraordinary that she has received Q1/Q2 evaluation scores of 4.8 and 4.9. Her second course, strategies and uses for epidemiology, is an introduction to epidemiology for non-epidemiology students. She has generally taught two 50-student sections each year with Q1/Q2 evaluation scores of 4.2-4.5/4.8-4.9. Both classes feature innovative teaching approaches through the use of a flipped classroom that encourages active learning. Professor Adar's teaching was acknowledged by the 2014 University of Michigan, School of Public Health's Excellence in Teaching Award.

Outside of the classroom, Professor Adar has chaired or co-chaired four doctoral student committees (two graduated), was a member of four other committees (three graduated), and mentored three post-doctoral fellows. She has also mentored 17 MPH students on capstone research projects, sponsored four student summer internships, and worked with six

undergraduate researchers. These trainees have been highly productive with contributions to 12 peer reviewed publications. Several of her trainees are also now building their own academic careers with faculty appointments at the University of Michigan Institute for Social Research, University of South Carolina Arnold School of Public Health, University of Texas at Houston, and Grand Valley State University and post-doctoral positions at the New York City Department of Health and Oregon State University.

Research: Professor Adar is uniquely strong in both exposure assessment and epidemiology of environmental exposures. She has successfully framed her work specifically for policy relevance. Her research program focuses on the characterization of the health impacts of community exposures to air pollution with additional interests in community noise, populations at increased risk from exposure, and intervention strategies to minimize exposures and improve public health. During her time in rank, she has produced several high impact findings towards these aims that inform local, national, and international environmental policy. For example, her research on school bus riders (PI, grant from the State of Washington) is the first and only study to provide direct evidence of the health benefits of switching to cleaner diesel fuel and technologies under the national Diesel Emissions Reduction Act. As a result, she was invited to present her findings to the director of the Office of Transportation and Air Quality at the Environmental Protection Agency (EPA) and shortly after her visit, the EPA reinvested an additional $7 million dollars to retrofit and replace old school buses around the nation. Through her research on the Multi-Ethnic Study of Atherosclerosis and Air Pollution (MESA Air) (co-I and PI of University of Michigan subcontract), Professor Adar also published a seminal paper on the relationship between long-term exposures to air pollution and the progression of atherosclerosis. As only the second paper of its kind in humans and the first in a population-based cohort, this highly cited paper has provided important information for the current review of the National Ambient Air Quality Standards on particulate matter. Similarly, Professor Adar's research on the Multi-Ethnic Study of Atherosclerosis and Coarse Particulate Matter (PI with Dr. Tim Larson, EPA STAR grant) has informed the National Ambient Air Quality Standards on particulate matter as the largest epidemiology study to date designed specifically to investigate the impacts of long-term exposures to coarse particles and health. Finally, Professor Adar has recently launched two highly novel lines of research (PI, NIH R21) on the role of the microbiome in the human response to inhaled pollutants and the impact of long-term neighborhood noise levels on chronic disease in American adults (PI, American Heart Association and PI, Alzheimer's Association).

With these contributions and others, Professor Adar's expertise on the health effects of community exposures to pollution has been recognized by her research community and policy makers as is evidenced by her role as an invited reviewer of the science underlying the National Ambient Air Quality Standards, a member of the Scientific Advisory Committee for a large EPA-funded Clean Air Research Center, a nominee for the EPA's general and particulate matter Clean Air Scientific Advisory Committees, an editorial review board member at the Environmental Health Perspectives, and an award winner for Excellence in Cardiovascular Epidemiology from the American Heart Association.

Since 2011, Professor Adar has published 29 peer-reviewed papers (six first, ten second, four senior author) plus one invited editorial and 43 abstracts at scientific conferences. This adds to

her previous research for a total of 45 peer-reviewed papers (thirteen first, eleven second, five senior author) plus two invited editorials, and 77 abstracts at scientific conferences. Her research has appeared (or will appear) in high profile medical journals (impact factor) including the *Lancet* (45.2), *Journal of the American College of Cardiology* (16.5), *American Journal of Respiratory and Critical Care Medicine* (12.0), and *PLoS Medicine* (14.4) as well as top environmental epidemiology journals including the *Environmental Health Perspectives* (7.0), *Epidemiology* (6.2), and *American Journal of Epidemiology* (5.0). Two papers were highlighted as editor's picks in *PLoS Medicine* and one led to her receipt of the American Heart Association's Sandra A. Daugherty Award for Excellence in Cardiovascular Epidemiology.

During Professor Adar's time in rank, she has been successful in competing for a wide range of grant funding to support her research (cumulative total direct costs: $1.3M since 2011). As a principal investigator, she has received funding from the EPA STAR program (R01-equivalent), NIAID R21 program, Alzheimer's Association, American Heart Association, State of Washington, and University of Michigan's MCubed program. Professor Adar was also the University of Michigan subcontract PI of an additional EPA STAR grant and an Israeli Environmental Health Fund grant as well as the epidemiology lead of an NINR R01. She has been a member of the Michigan Institute for Clinical and Health Research center, NIOSH ERC training grant, and NIEHS P30 Center.

Recent and Significant Publications:

Adar SD, D'Souza J, Mendelsohn-Victor K*, Jacobs D, Cushman M, Sheppard L, Thorne PS, Burke GL, Daviglus ML, Szpiro AA, Diez-Roux AV, Kaufman JD, Larson TV. Long-term concentrations of airborne coarse particulate matter (PM10-2.5), inflammation, and coagulation in the Multi-Ethnic Study of Atherosclerosis (MESA). *Environ Health Persp.* 2015. 123(6): 541-548. doi: 10.1289/ehp.1308069.

Adar SD, D'Souza J , Sheppard L, Jahnke J, Halstrand T, Kaufman JD, Davey ME, Sullivan JR, Koenig J, Lewtas J, Liu LJS. Adopting Clean Fuels and Technologies on School Buses: Pollution and Health Impacts in Children. *Am J Resp Crit Care Med.* 2015. 191(12): 1413-1421. doi: 10.1164/rccm.201410-1924OC.

Zhang K*, Larson T, Gassett A, Szpiro AA, Sheppard L, Adar SD. Characterizing spatial patterns of airborne coarse particulate (PM10-2.5) mass and chemical components in three cities: The Multi-Ethnic Study of Atherosclerosis (MESA). *Environ Health Persp.* 2014. 122: 823-830. doi:10.1289/ehp.1307287.

Adar SD, Sheppard EL, Vedal S, Polak JF, Sampson PD, Roux AD, Budoff M, Jacobs D, Barr RG, Watson K, Kaufman JD. Fine particulate air pollution and the progression of carotid artery intima-medial thickness: The Multi-Ethnic Study of Atherosclerosis and Air Pollution. *PLoS Med*. 2013. 10(4): e1001430. (Featured "editor's pick" paper).

Adar, SD, Klein R, Klein BEK, Szpiro AA, Cotch MF, Wong T, O'Neill MS, Shrager S, Siscovick D, Daviglus M, Sampson P, Kaufman J. Air pollution and the microvasculature: A cross-sectional assessment of *in vivo* retinal images in the population-based Multi-Ethnic Study of Atherosclerosis cohort. *PLoS Med.* 2010. 7(11):31000372. PMC2994677 (Featured "editor's pick" paper).

Service: Professor Adar has served as an invited expert as part of the EPA's development of the National Ambient Air Quality Standards for particulate matter and oxides of sulfur, a member of an external scientific advisory committee to an EPA-funded Clean Air Research Center, and a member of the scientific program committee for two International Society of Environmental Epidemiology conferences. She has reviewed grant proposals for local and international organizations including the United Nations Foundation Global Alliance for Clean Cookstoves, Belgian Flanders Research Foundation, Israeli Environmental Health Fund, German-Israeli Foundation, University of Michigan, and Wayne State University. Professor Adar also regularly serves as an ad hoc reviewer for numerous journals such as *Circulation*, *Heart*, *European Heart Journal*, *PLoS Medicine*, and *Epidemiology*, is on the editorial board for *Environmental Health Perspectives*, and is a section editor for *Current Environmental Health Reports*. Professor Adar is a member of the International Societies of Environmental Epidemiology and Exposure Science, American Thoracic Society, and American Heart Society. Locally, she has served on numerous committees including the PhD task force, PhD committee, chair search, and recruitment committees. She has also served on the UMSPH collaboration for teaching excellence committee and has spoken at recruitment events, to the Dean's Advisory Board, and lectured for the Undergraduate Research Opportunities Program.

External Reviewers:

Reviewer A: "…at the time by far the most important analysis of air pollution in relation to the progression of chronic cardiovascular disease. Dr. Adar is well positioned to become one of the leading environmental health scientists in the country. I am very confident that Dr. Adar would receive promotion and tenure at [my institution]."

Reviewer B: "I rate the quality, quantity, focus and impact of her academic work as outstanding. Her outstanding qualities as an investigator are recognized by her peers and key federal and private funding agencies."

Reviewer C: "Dr. Adar's scholarly work is of very high quality. I think the quality, impact and productivity of her scholarly work put her standing above others in her peer group. [She] stands out in the air pollution epidemiology field with her contribution to studies that add novelty, sophistication, depth and true advancement to our understanding of air pollution and health."

Reviewer D: "Her work has been at the cutting edge of exploring health impacts of community-level exposures to air pollution, focusing on exposure to particulate matter air pollution and prevalent cardiovascular disease outcomes. Dr. Adar is a well-established investigator in environmental health at the national and international levels. She is widely recognized as a leader in the field whose scholarly work has been consistently of the highest quality."

Reviewer E: "Dr. Adar is a rising star in the field of environmental health research who has already had a substantial impact on the field of air pollution research."

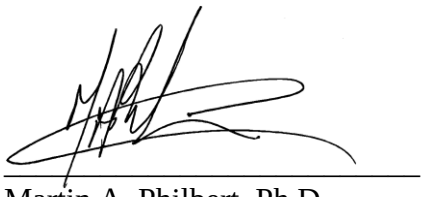
Reviewer F: "Her publications have received substantial attention by media and experts in the field, and have also influenced policy makers and urban planners."

Reviewer G: "She is an exceptionally bright, competent and capable researcher who has made and is continuing to make substantial and important contributions to our understanding of health effects of air pollution. I think that an evaluation of her teaching, citizenship, and scholarly output and contributions would almost certainly result in a positive evaluation for promotion at [my institution]."

Reviewer H: "Overall her publication record is strong and her international recognition widespread… She stands above many of her peers at the same level, given this strong publication record, presentation and recognition at international epidemiology and governmental health meetings, and her research funding track record."

Reviewer I: "Dr. Adar's contributions to research are well recognized on the national and international stage. [Her] publications have all been of high quality and scientific value."

Summary of Recommendation:
Professor Adar is an outstanding researcher and a dedicated teacher. Her productivity has provided research and training opportunities to numerous students. It is with the support of the School of Public Health Executive Committee that I recommend Sara D. Adar for promotion to associate professor of epidemiology, with tenure, Department of Epidemiology, School of Public Health.



Martin A. Philbert, Ph.D.
Dean, School of Public Health

May 2017