Advances in Physical Activity and Nutrition Environment Assessment Tools and Applications

Recommendations

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Introduction: In the past 15 years, researchers, practitioners, and community residents and leaders have become increasingly interested in associations among built environments and physical activity, diet, and obesity. Numerous tools to measure activity and food environments have been developed but vary in quality and usability. Future progress depends on aligning these tools with new communication technology and increasing their utility for planning and policy.

Methods: The Built Environment Assessment Training Institute Think Thank was held in July 2013. Expert participants discussed priorities, gaps, and promising opportunities to advance the science and practice of measuring obesity-related built environments. Participants proposed and voted on recommended future directions in two categories: "big ideas" and additional recommendations.

Results: Recommendations for the first "big idea" involve developing new, simplified built environment assessment tools and deploying them through online trainings and easily accessible web-based apps. Future iterations of the tools would link to databases of key locations (e.g., parks, food stores); have built-in scoring and analysis; and provide clear, simple feedback to users. A second "big idea" addresses dissemination of results from built environment assessments and translation into policies including land use and food access planning. Additional recommendations include (1) improving multidisciplinary collaborations; (2) engaging stakeholders across sectors; (3) centralized data resource centers; (4) increased use of emerging technologies to communicate findings; and (5) advocating for expanded funding for measurement development, training, and dissemination.

Conclusions: Implementing these recommendations is likely to improve the quality of built environment measures and expand their use in research and practice.

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Introduction

In the past two decades, the role of the built environment in physical activity, diet, and obesity has been extensively researched[1] and used to inform practice and policy.[2,3] However, there has been great heterogeneity in study designs, measures used, and findings of associations among environments, behaviors, and obesity.[1,4,5] Systematic reviews and commentaries have pointed to the complexity of conceptual frameworks, design limitations, context specificity of studies, and the need for greater clarity in results that can drive policy change and, ultimately, health behavior change and health improvements.[1,3,4,6–8]

Advances in our understanding of the built environment and changes in such environments and health-related behaviors and outcomes depend on the availability and usability of high-quality, practical assessment tools to measure the environment and on the

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interests of qualified scientists to use these methodologies in well-designed research.[9] Reviews[10–12] of available measures and systems (e.g., databases)[13] to assist researchers in identifying measurement and surveillance tools are helping to move the field forward. Because many measures are observational, training programs also are essential to progress. Beginning in 2008, the Built Environment Assessment Training (BEAT) Institute has provided didactic and hands-on field training and train-the-trainer experiences in assessment to more than 150 researchers and practitioners.[14]

In 2013, the BEAT Think Tank brought together 29 leading experts to identify priorities for future research, application of measures, and training. One of the key goals of the BEAT Think Tank was to develop recommendations and set an agenda for the future of the field. This article describes the process for developing the recommendations and summarizes the resulting recommendations.

Method for Generating Recommendations

Before the Think Tank, each participant was asked to identify one or two "big ideas" for the future of built environment measurement and to bring those ideas to the meeting. Participants were then instructed to write their ideas on index cards, which were collected on the first morning. The facilitator sorted the ideas and posted them. The ideas were discussed, and expanded or combined where appropriate, later in the day. The next morning, the "big idea" clusters were posted, and each participant was given two colored stickers to vote for their preferred ideas out of the ten top ideas that had been proposed. Results were presented to the entire group near the end of the Think Tank and each participant was invited to give final thoughts about the top-ranked recommendations.

The 2-day Think Tank agenda included breakout sessions on four key issues: (1) tools for measuring food and activity environments; (2) advancing technology use; (3) designing measures for dissemination and advocacy; and (4) using built environment measures for policy change and surveillance. The 2-hour sessions that covered each of these issues allowed time for discussion of recommendations and future priorities. The discussions were audio recorded and notes were taken, and the top recommendations identified in each session were brought back to the larger group for discussion. Those discussions refined the recommendations and identified additional foci, including the topics for the four papers in this Theme Issue.

Recommendations for "Big Ideas"

Each of the "big ideas" that was strongly endorsed by Think Tank participants was modified, expanded, and combined during discussion. The large group discussion revealed that these ideas were multifaceted and complex but could be grouped around a set of core actions. Two ideas received the majority of votes (Table 1).

The first "big idea" recommendation involves a cluster of advances needed to develop new, simplified built environment assessment tools and to expand their use in research and practice. This recommendation stemmed from the awareness that many of the existing tools were designed for and still only most applicable and used in the research context. These tools are lengthy and still primarily paper based and involve separate scoring

Table 1. "Big Ideas" Recommendations From the 2013 BEAT Think Tank

Idea cluster	Actions and areas for development
New assessment tools, simplified measures, online training, and apps	Adaptations of the best measures available Simplified, practical observational measures Online trainings and web-based/mobile apps for accessing tools and implementation guidance Built-in scoring, analysis, data displays Databases of key locations that can be merged into measurement database Links to GIS/mapping to locate place-based measures Standard definitions Continual updating of source databases
Dissemination and translation of findings from built environment assessments	Frame research-to-action translation as short, medium, and long term Identify multiple relevant stakeholders in various sectors of government, industry, education, medicine and nonprofits Use optimal communication media—both "push" and "pull"—webinars, podcasts, specialized sessions at professional meetings Work with multiple disciplines through collaborations between their professional organizations (e.g., American Planning Association and American Dietetic Association)

BEAT, Built Environment Assessment Training.

procedures and are thus not feasible for practitioners or community leaders or residents to use. The tools could be deployed through online trainings and easily accessible web-based apps, incorporate existing resource databases of key locations (e.g., parks, food stores), have built-in scoring and analysis, and provide clear, simple feedback to users. Other dimensions of this idea involved establishing standard definitions, "branding" the measures as approved for use and adaptation, and continually updating resource databases that could be accessed by users of the tools.

The second "big idea" addresses dissemination of results from built environment assessments and translation into policies including land use and food access planning. This recommendation stemmed from the seeming disconnect between environment assessment activities and the engagement of decision makers whose work impacts these environments. Closing this gap would involve identifying and seeking input from multiple relevant stakeholders in various sectors of government and industry (not just public health and medicine). The goal would be to ensure inclusion of items on environmental tools that are relevant and actionable for these decision makers. Next, the idea of translating research into action would be framed as short, medium, and long term—appropriate to the time frames necessary to make changes in areas such as land use, pedestrian infrastructure, and access to fresh food retailers. A third aspect of this recommendation included making optimal use of opportunities to communicate findings of research using environmental measures through webinars, podcasts, and special multidisciplinary and interprofessional sessions at professional meetings.

Additional Recommendations

Additional recommendations identified during the Think Tank sessions were (1) the need to improve multidisciplinary collaborations; (2) engaging stakeholders across sectors; (3) centralized data resource centers that can capture existing environment measurement data; (4) increased use of emerging technologies to communicate measures and findings; and (5) advocating for expanded funding opportunities for measurement development, training, and dissemination. Table 2 provides some details on areas for development of these recommendations and who or what examples should be involved. An article in this Theme Issue provides more detail in two of these areas (multidisciplinary collaboration and new technologies).[15]

Table 2. Recommendations From the 2013 BEAT Think Tank

Recommendation	Areas for development	Who/what should be involved
Collaboration across disciplines	Collaboration across disciplines involved in built environment assessment: researchers, educators, trainees	Nutrition, activity, transportation, planning, economics Build interdisciplinary trainings in universities Encourage peer-reviewed journals to invite multidisciplinary papers
Engaging stakeholders across sectors	Engagement beyond health and planning	Local governments, communities, city/regional planners Consider stakeholders not only in public health and policy fields—transportation, food retail, etc. Encourage and assist researchers to think about how tools, measures, and results can be used Support community relationship building in grants
Data processing and pooling	Centralized data resource center(s)	Informatics, increasingly "big data" Model after NHANES, use for national sample of audits
Utilize emerging technologies	Disseminate ideas and information	Webinars, TEDx talks, online trainings Real-time data linking environment and behavioral data Social media for communicating results and attracting comments and interactive discussion, debate
Identify funding opportunities	Advocate for funding for research, training, and practical translation	Federal agencies: USDA, NIH, CDC Collaborations, foundations: NCCOR, RWJF

BEAT, Built Environment Assessment Training; NCCOR, National Collaborative on Childhood Obesity; NHANES, National Health and Nutrition Examination Survey; RWJF, Robert Wood Johnson Foundation; USDA, U.S. Department of Agriculture.

Follow-Up on Recommendations

Actions to move forward on some of the recommendations began shortly after the BEAT Think Tank ended. A blog on the Active Living Research website spread the word about the Think Tank and planned outcomes (www.activelivingresearch.org/blog/2013/07/node/13027). Conference calls with government leaders to discuss prospects for community-oriented built environment surveillance systems and data resource systems took place. A proposal for funding a next-generation BEAT Institute training was developed (though it has not yet been funded), which focused on better researcher–practitioner collaboration around environmental measurement tool development and implementation. Online training programs for training on measuring food and physical activity environment, developed as part of the BEAT Institute, are ongoing (www.med.upenn.edu/beat/onlinetraining.shtml). Work is in progress, and pilot testing has been completed, to adapt a software system (www.countertools.org) to collect and organize food store and restaurant data for efficient data collection of the Nutrition Environment Measures Surveys[16–18] and to help build community support for health-promoting policies and planning. Finally, the current Theme Issue on Moving the Field Forward in built environment assessment and intervention was developed to reach a wide audience of researchers, practitioners, and policymakers.

Discussion

The recommendations that emerged from the BEAT Think Tank complement those developed from previous conferences on measuring and studying built environments related to obesity, physical activity, and diet.[9,19] The previous conferences were supported by the NIH and focused strongly on informing research agendas and research funding. The present recommendations are deliberately broader—meant for researchers, non-scientist users of measurement tools, educators and trainees, policymakers, and funders of both programs and research. They are intended to plant fertile ideas for future work in the area of built environment measurement by an ever-widening range of users who can move the understanding of environments and activity, diet, and obesity forward with the ultimate goal of improving opportunities for active living and healthy eating.

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Appendix

Supplementary data

Supplementary data associated with this article can be found at http://dx.doi.org/10.1016/j.amepre.2015.01.023.

Appendix Table 1. Participants in the 2013 BEAT Think Tank.

Name	Affiliation[a]
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Allison Karpyn, PhD	The Food Trust
Abby King, PhD	Stanford University
Susan Klein, MS	Consultant/Project Manager (retired), Des Moines Area Religious Council
Shiriki Kumanyika, PhD, MPH [b]	University of Pennsylvania
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MaryAnn Pentz, PhD	University of Southern California
Lisa Powell, PhD[b]	University of Illinois, Chicago
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Sandy Slater, PhD [c]	University of Illinois, Chicago
Mary Story, PhD, RD	Healthy Eating Research and University of Minnesota
Carol Voss, MEd, RD, LD	Iowans Fit for Life, Iowa Department of Health
Meghan Winters, PhD; MSc	Simon Fraser University

Amy Yaroch, PhD	Gretchen Swanson Center for Nutrition and University of Nebraska Medical Center

[a]Affiliation at the time of the Think Tank
[b]BEAT Institute Faculty
[c]BEAT Institute Alumni