# A Community-Powered, Asset-Based Approach to Intersectoral Urban Health System Planning in Chicago

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*Objectives.* To describe, and provide a nomenclature and taxonomy for classifying, the economic sectors and functional assets that could be mobilized as partners in an intersectoral health system.

*Methods.* MAPSCorps (Meaningful, Active, Productive Science in Service to Community) employed local youths to conduct a census of all operating assets (businesses and organizations) on the South Side of Chicago, Illinois, in 2012. We classified assets by primary function into sectors and described asset and sector distribution and density per 100 000 population. We compared empirical findings with the Institute of Medicine's (IOM's) conceptual representation and description of intersectoral health system partners.

*Results.* Fifty-four youths mapped a 62-square-mile region over 6 weeks; we classified 8376 assets into 23 sectors. Sectors with the most assets were food (n = 1214; 230/100 000 population), trade services (n = 1113; 211/100 000), and religious worship (n = 974;185/100 000). Several large, health-relevant sectors (2499 assets) were identified in the region but not specified in the IOM's representation. Governmental public health, central to the IOM concept, had no physical presence in the region.

*Conclusions.* Local youths identified several thousand assets across a broad diversity of sectors that could partner in an intersectoral health system. Empirically informed iteration of the IOM concept will facilitate local translation and propagation. (*Am J Public Health.* 2016;106:1872–1878. doi:10.2105/AJPH.2016.303302)

The 1978 Declaration of Alma-Ata called on representatives across sectors and nations to collaborate to improve population health.[1] A decade later, in response to concerns about the effectiveness of the US public health system, the idea of intersectoral responsibility for population health emerged again from the US Institute of Medicine (IOM).[2] The IOM outlined a strategy to measurably improve US population health and described threats such as HIV/AIDS, adolescent pregnancy, and Alzheimer's disease "that can be averted or lessened only through collective actions aimed at the community," rather than solely through individual-level medical care.[2(p20)]

In 2001, the US government charged an IOM committee with developing a framework for population health.[3] The resulting report promoted the "intersectoral public health system" as the framework for population health improvement and named 5 sectors, in addition to governmental public health, as "powerful actors" for ensuring optimal public health (the health care delivery system, employers and business, the media, academia, and the community). This report acknowledged that public health occurs within complex systems and is influenced by many individual and environmental factors.[3] Later, the IOM published a 3-report series that made the "case for increased accountability for all sectors that affect health . . . with coordination by the government public health infrastructure."[4(pXV)] The 2003 and 2011 reports include a figure representing "the circle of system partners"[3,4] that was iterated over time from a 1997 World Health Organization (WHO) report[5] and has been broadly presented as a representation of the intersectoral health system concept.

The 2010 Patient Protection and Affordable Care Act (ACA)[6] created the US National Prevention Council, a coordinating body tasked with guiding federal agencies across sectors to work individually and together to improve population health.[7,8] With input from a variety of stakeholders, the Council published in 2011 the National Prevention Strategy, a "cross-sector, integrated national strategy" for improving US population health.[8] The ACA and the National Prevention Strategy are driving the adoption of intersectoral health system principles into practice. For example, the US Centers for Medicare & Medicaid Services approved funding to pay providers to connect

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selected patients to community services that address social needs. However, even with financial incentives, service providers cannot effect population-level change without reliable data about local assets and a common infrastructure through which to exchange data and communications.[9,10]

The intersectoral health system framework, although tested in some locales for prevention and management of specific diseases,[11,12] is largely untested in the United States as a strategy for ensuring wellness and disease management of a geographically defined population. Diverse stakeholders (e.g., physicians, community organizations, faith and business leaders, youths and older adult residents) in 1 large, urban area on the South Side of Chicago, Illinois, have been collaborating, using an asset-based, community-engaged research approach,[13] to build communitywide infrastructure for population health improvement. This approach combines values and principles from asset-based community development[14] and community-based participatory research.[15] Community stakeholders urged a strategy that would (1) generate a reliable, publicly accessible, living inventory of community assets that everyone could use to improve the human condition; (2) engage and employ youths in the improvement work; and (3) adopt a WHO-inspired definition of health, to include economic vitality.[16] A central hypothesis is that medical and public health activities should drive demand for resources (e.g., tobacco cessation, weight loss, job placement) that community-based businesses and organizations could supply. The emergent system would promote individual-level health, reduce preventable health care costs, strengthen social ties, and support the vitality of the local economy, thereby producing sustainable population health improvement.

Drawing on ideas from leading US (IOM) and international (WHO) agencies promoting the intersectoral health system framework for population health improvement, we empirically describe the sectors that might partner in an intersectoral health system on Chicago's South Side. Building on the IOM intersectoral health system framework, we propose empirically informed iteration of the "circle of system partners" concept to facilitate local translation, propagation, and comparative study.

## METHODS

The South Side of Chicago study region (62 $mi^2$ across 10 of the 12 zip codes composing the primary service area of the only tertiary care academic medical center and one of the largest employers in the region) was home to 528 000 residents; 78.2% identified as African American and 13.4% as Hispanic. The median annual household income was $30 965, 32.2% were living at or below the federal poverty level, and unemployment was 22.2%.[17] The 2005 to 2009 population-weighted, age-adjusted, all-cause mortality rate was 940 per 100 000 population[18] (compared with 837 in the City of Chicago, 771 in Illinois, and 767 in the United States). Disease-specific mortality rates were also higher on the South Side: 78.5 deaths per 100 000 population were attributed to diabetes on the South Side versus 70.1 Chicago-wide, and 51.9 deaths per 100 000 population were from cerebrovascular disease versus 44.6 Chicago-wide.[18]

### Generating an Inventory of Community Assets

Launched in 2009 at the University of Chicago,[13,19,20] MAPSCorps (Meaningful, Active, Productive Science in Service to Community) employs local youths to conduct an annual block-by-block census of community assets, defined as any public-facing business or organization that offers goods or services. We previously showed that commercial data for this region had low sensitivity (61%) for these assets.[19] By 2015, MAPSCorps had employed more than 300 high school students, who were supervised and mentored by more than 100 college students, and it covered 38 Chicago communities (110 $mi^2$, 16 zip codes). The present study used 2012 MAPSCorps data to inventory all assets across all sectors in the region.

The MAPSCorps asset census protocol, including the rationale and a description of stakeholders, has been previously described.[13,19] Appendix A (available in the online version of this article at http://www.ajph.org) summarizes the field, training, and data quality assurance protocol. Briefly, the 2012 census identified all assets in the study region by direct observation. We collected names, locations, and primary function of all assets using MapApp, a custom mobile phone application, and categorized them according to a custom taxonomy[19] adapted from Standardized Industrial Classifications[21] and the National Taxonomy of Exempt Entities.[22]

We gathered supplemental data about the programs and services provided by food pantries (Taryn Roch, manager of research and evaluation, Greater Chicago Food Depository, unpublished data, 2012), public parks (http://www.chicagoparkdistrict.com), and school- and shelter-based health centers (http://findahealthcenter.hrsa.gov). Efforts to identify local public health–related sites included supplemental searches of city, county, and state government Web sites and Google and Yelp directories.

We conducted phone queries and Web site reviews from March through May 2013 to differentiate between outpatient clinics that were "medical clinics" (sites where licensed medical practitioners see patients for direct medical care) from "other clinics" (dental, optometry, or chiropractic). We subclassified "medical clinics" as "primary care" (comprehensive medical care by general practice, family medicine, internal medicine, or pediatrics providers), "specialty care" (care focused on 1 body system such as obstetrics–gynecology or cardiology), or "multispecialty care" (services from primary and specialty care providers). We classified dialysis sites separately. We coded sites where a psychiatrist or ophthalmologist was present as specialty care and sites where a psychiatrist or ophthalmologist was not present as "other clinics" offering mental health counseling or optometry services. We considered sites offering health-related services (e.g., medication, therapy, rehabilitation, or medical transportation) to be "health support services."

### Classifying Assets Into Sectors

From October through December 2012, we conducted a review of IOM and WHO intersectoral health system publications to inform development of a "functional sector taxonomy," recording all named sectors. Using a consensus process among authors, we grouped synonymous sector names by function, defined as what the sector would primarily do or provide to a consumer. We compared the resulting sector names with empirical data about sectors in

the study region. We reconciled sector names from the literature with names from all sectors in the region to achieve mutually exclusive classification of all observed assets. We excluded from the functional sector taxonomy those sectors named in the literature that were not named by function (e.g., "multilateral organizations" or "interagency partners"; Appendix B, available in the online version of this article at http://www.ajph.org).

## Empirical Assessment of the Intersectoral Concept

Using the functional sector taxonomy and data collected by the youths about the primary function of each asset, we classified all assets identified by the MAPSCorps census. We calculated total asset counts, sector counts, and counts per 100 000 population using Stata version 13.0 (StataCorp LP, College Station, TX). We compared empirical findings with the IOM's 2011 conceptual representation and description of intersectoral health system partners[4] (Appendix C, panels A and B, available in the online version of this article at http://www.ajph.org). We first sorted asset data according to the sectors named in the IOM model. Circles, representing each partnering sector, were sized to represent the relative number of observed assets classified in each. We separately represented other asset types that did not correspond with one of the IOM model sectors, again using circles sized to represent the relative number of observed assets in each sector.

We then developed a comprehensive visual iteration of the IOM "circle of system partners" for the study region (Appendix C, panel C), incorporating all observed assets, classified according to the functional sector taxonomy. Last, we developed a schematic representation of a national intersectoral health system (Appendix D, available in the online version of this article at http://www.ajph.org).

# RESULTS

In 2012, MAPSCorps partnered with 3 community development organizations and a citywide youth employment agency to employ 54 local high school youths. We paired youths with 11 science-oriented, college-age adults trained as field supervisors and mentors. During the 6-week program, the youths mapped 62 square miles (10 zip codes) and identified 8105 businesses and organizations. Among the high school youths, 81% were African American, 17% were non-Black Hispanic, and 65% were female. MAPSCorps was the first paid job experience for 57% of the MAPSCorps youths.

## Empirically Derived Functional Sector Taxonomy

The IOM and WHO named 33 sectors in 17 publications (Appendix E, available in the online version of this article at http://www.ajph.org) about "intersectoral action" and the "intersectoral health system." Most sectors (n = 23) were named according to function, or the goods and services they provided. Ten sectors were named according to structural or institutional characteristics, not function. The naming conventions were applied inconsistently within and across publications. After reconciling synonymous and overlapping sector names from the literature, we replaced sectors too broad to allow for classification of assets by primary function (e.g., "businesses and employers") with more specific functional sector names informed by IOM definitions[3] and empirical observations from the asset census. The final functional sector taxonomy named 28 sectors, each with a unique primary function (Appendix B).

## Potential Intersectoral Health System Partners

In the study region, 8376 operating assets were identified (8105 by the youth asset census, 271 by supplementary data collection; Table 1). Using data collected by the youths about the primary function of each mapped asset, we classified these assets into 28 sectors in the functional sector taxonomy. The largest sectors, by number of assets, were food (n = 1214; 443 of these were fast food), trade services (n = 1113; 168 were property services offices, 96 were banks), and religious worship (n = 974; 928 were Christian churches). The sectors with the fewest assets, but with at least 1 asset in the region, were public works and defense (Table 1).

The dominant asset types were Christian churches (175.9 per 100 000 population; 2.8/mi$^2$) and fast-food restaurants (84.0 per 100 000; 1.4/mi$^2$). There were as many liquor stores and bars as there were primary care clinics (both 24.3 per 100 000; 0.4/mi$^2$). Examples of other assets included mental health counseling clinics (10.4 per 100 000; 0.2/mi$^2$), dialysis clinics (2.3 per 100 000; 0.03/mi$^2$), and weight-loss centers (0.9 per 100 000; 0.02/mi$^2$).

Three quarters of the 567 assets in the clinical care delivery sector were outpatient clinics (80.4 per 100 000 population; Table 2). Primary care was offered at 30% of outpatient clinics; 41% of these primary care sites also offered specialty care. Dental clinics were the most prevalent type of outpatient clinic (n = 110; 20.9 per 100 000). Pharmacies and medical supply stores were the most common type of health support services found in this region (44% of health support services; n = 59; 11.2 per 100 000).

No assets with public health as their primary function were identified by the MAPSCorps-conducted census. A supplementary Web search identified limited government public health activities through "partnerships"[23] at clinical care delivery sector sites (2 in primary care clinics, 2 in mental health clinics) and at 1 public safety sector site. The public safety site coordinated emergency preparedness between public health, police, emergency management, aviation, and fire.

## From Conceptual to Empirical Understanding

The IOM's 2011 visual representation of intersectoral health system partners (Appendix C, panel A) depicts 7 sectors: 4 named by function (clinical care delivery system, media, education, and governmental public health) and 3 named using more general terms (community, government agencies, and employers or businesses). The representation located governmental public health infrastructure in the center to differentiate it from other government agencies and to highlight it as the convener of all other sectors. The IOM visually depicted sectors using circles of uniform size. Narrative descriptions did not indicate whether this uniformity was schematic or was intended to

**TABLE 1—Asset and Sector Distribution and Density per 100 000 Population: South Side, Chicago, IL, 2012**

| Sector, by Function of Its Assets | Types of Assets Represented in Sector, by Primary Function | Total No. of Assets Observed in Study Region | No. of Assets per 100 000 Population | Cited by IOM | Cited by WHO |
|---|---|---|---|---|---|
| Food | Convenience or grocery stores, restaurants, food pantries, produce markets | 1214 | 230.1 | √ | √ |
| Trade services[a] | Places that primarily sell services (e.g., florists, funeral homes, banks, research labs) | 1113 | 211.0 | | |
| Religious worship | Churches, synagogues, temples, mosques | 974 | 184.6 | √ | √ |
| Retail[a] | Places that primarily sell goods to the public | 866 | 164.2 | | |
| Personal services[a] | Beauty salons, barber shops, massage parlors, body art shops, psychics, laundromats, tailors | 765 | 145.0 | | |
| Transportation | Public transit stops; vehicle sales, rental, repair; gas stations; parking lots | 587 | 111.3 | √ | |
| Clinical care delivery | Hospitals, outpatient providers, health supports | 567 | 107.5 | √ | √ |
| Education | Public or private elementary, middle, or high schools; community or technical colleges; universities; tutoring or learning support centers | 414 | 78.5 | √ | √ |
| Child care | Home- or center-based day cares, preschools | 309 | 58.6 | √ | √ |
| Wholesale or storage[a] | Warehouses, storage facilities, business-to-business sales | 228 | 43.2 | | |
| Social gathering[a] | Community or neighborhood centers, event spaces, social halls or clubs, community gardens | 226 | 42.8 | | |
| Recreation | Parks, fitness facilities, cycling stores, sports fields, golf courses | 221 | 41.9 | √ | √ |
| Industry | Places of industrial processing or production | 182 | 34.5 | √ | √ |
| Housing | Programmed, supportive living (e.g., nursing homes), shelters, hotels, dormitories | 168 | 31.8 | √ | √ |
| Culture | Arts and entertainment venues | 138 | 26.2 | √ | √ |
| Social services | Employment, child welfare, senior and other services offices | 111 | 21.0 | √ | √ |
| Political and advocacy | Political representatives and parties, community organizing, political action, social advocacy offices | 80 | 15.2 | √ | √ |
| Public service | Post offices, libraries, government administration offices | 76 | 14.4 | √ | |
| Justice | Law offices, courthouses, notaries, bail bondsmen | 60 | 11.4 | | √ |
| Public safety | Police and other law enforcement stations, fire departments | 33 | 6.3 | √ | √ |
| Media | TV, radio, newspaper offices; book-publishing houses; film production sites | 26 | 4.9 | √ | √ |
| Public works | Water and electric utilities | 12 | 2.3 | | √ |
| Defense | Military recruitment offices, bases, storages | 6 | 1.1 | √ | |
| Public health | Governmental offices dedicated to public health | 0 | 0 | √ | √ |
| Agriculture | Farming, other food production facilities | 0 | 0 | | √ |
| Animal husbandry | Places managing or caring for farm animals | 0 | 0 | | √ |
| Philanthropic organizations | Private initiatives for public good | 0 | 0 | √ | √ |
| Urban planning | Organizations dedicated to land use assessment, design of urban areas | 0 | 0 | √ | √ |
| Total | | 8376 | 1587.8 | | |

*Note.* IOM = Institute of Medicine; WHO = World Health Organization.

[a]Sector names added to the functional sector taxonomy on the basis of empirical findings in the study area.

TABLE 2—Asset Distribution and Density in the Clinical Care Delivery Sector as Observed in the Study Region: South Side, Chicago, IL, 2012

| Asset Type | Total No. of Assets Observed in Study Region | No. of Assets per 100 000 Population |
|---|---|---|
| **Outpatient clinics[a]** | | |
| Medical clinics | 194 | 36.8 |
| Primary care | 75 | 14.2 |
| Primary and specialty care | 53 | 10.0 |
| Specialty care only (no dialysis) | 36 | 6.8 |
| Dialysis clinics | 12 | 2.3 |
| Could not be determined[b] | 18 | 3.4 |
| Other clinics | 230 | 43.6 |
| Dentist | 110 | 20.9 |
| Mental health or counseling center | 55 | 10.4 |
| Podiatry or foot care | 21 | 4.0 |
| Chiropractor | 16 | 3.0 |
| Optometrist or eye care | 15 | 2.8 |
| Complementary medicine | 13 | 2.5 |
| **Health support services[c]** | | |
| Pharmacy or medical supply | 59 | 11.2 |
| Outpatient therapy or rehabilitation | 36 | 6.8 |
| Other health services | 17 | 3.2 |
| Lab or diagnostic center (outpatient) | 7 | 1.3 |
| Mobile health services office | 5 | 0.9 |
| Inpatient rehabilitation | 5 | 0.9 |
| Weight loss center | 5 | 0.9 |
| Medical transport | 1 | 0.2 |
| **Inpatient hospitals** | | |
| Overall | 8 | 1.5 |
| **Total** | | |
| Overall | 567 | 107.5 |

[a]A total of 424 outpatient clinics were observed in the region; 80.4 outpatient clinics per 100 000 population.
[b]No answer to multiple attempted phone calls, no information found in Internet searches.
[c]A total of 135 health support services were observed in the region; 25.6 health support service providers per 100 000 population.

suggest equity in contribution from, or accountability across, the "powerful actors" composing the system.[4]

To compare the conceptual representation and empirical findings in the study region, we created an analogous visual depiction of the distribution of observed assets on Chicago's South Side (Appendix C, panel B). The clinical care delivery system, media, education, and governmental public health sectors featured in the 2011 IOM representation aligned with the functional sector taxonomy used to classify the study region assets and accounted for 1007 (12%) of all of the observed assets in the region. Wherever possible, we assigned all observed assets classified by functional sector taxonomy to IOM sector names, as follows: all trade services, retail, personal services, wholesale or storage, and industry sectors (n = 3154) to the IOM "employers and business" circle; all religious worship, social gathering, culture, and social services sectors (n = 1449) to the "community" circle; all defense, justice, public works, public service, public safety, and political and advocacy sectors (n = 267) to the "government agencies" circle.

More than 2400 assets in 5 other sectors (child care, food, housing, recreation, and transportation) commonly associated with social determinants of health could not be assigned to sectors named in the IOM depiction and are pictured separately (Appendix C, panel B). A proposed iteration of the IOM depiction (Appendix C, panel C) represents all sectors in the study region that could partner in an intersectoral health system. Sector size was nonuniform as measured by number of assets (range = 6–1214 assets by sector), and 4 sectors named in the intersectoral health system literature—agriculture, animal husbandry, philanthropy, and urban planning—had no public-facing physical assets in the study region. Governmental public health, the sector envisioned by the IOM as the coordinating body for the intersectoral health system, had very limited operations in the study region and no physical assets with a primary public health function.

## DISCUSSION

For more than a decade, the IOM has articulated the rationale for a paradigm shift, now codified in the ACA,[6] that distributes responsibility for population health across multiple sectors. This shift requires public health to work together with health care delivery organizations and other sectors in the communities they serve. In this study, building on IOM and WHO concepts, stakeholders in 1 large urban region with a high burden of preventable disease and premature mortality began the system-building process by taking stock of every business and organization across every sector that could potentially partner in an intersectoral health system. As others have shown for related community-building efforts,[24,25] we demonstrate that youths can be meaningfully engaged in the basic activities of building an intersectoral health system. Building on local assets and engaging youths will promote the sustainability of this work.[20,25]

In contrast to a prevailing deficit-based view[14] of the region's resources, we identified more than 8300 operating assets across 23 sectors. The region's economy was dominated by food, trade services, and religious worship sectors, with more than 7 Christian

churches and more than 3 fast-food restaurants for every primary care clinic. There were more than twice as many dialysis clinics as there were weight loss centers and almost twice as many food pantries as large grocery stores. There were also hundreds of places for social gathering, arts and entertainment, recreation, child care, and social services. These asset types can positively affect the social determinants of health and should be considered potentially powerful partners for building a durable intersectoral health system in this region.

The 2011 IOM report envisions governmental public health agencies at the core of an intersectoral health system that distributes accountability for population health across sectors.[4] Our study found limited government public health activity and no assets with a primary public-facing governmental public health function in this 62-square-mile, densely populated urban region. One site, the City of Chicago Public Safety Headquarters, was found to coordinate emergency preparedness between public health, police, emergency management, aviation, and fire departments—an important role for the community but not one dedicated to addressing the disproportionately high rates of preventable chronic illness or upstream factors[26] affecting health in the study neighborhoods. Whether this asset would be politically viable as a regional coordinator for population health warrants further exploration.

These empirical observations raise questions for practical translation of the IOM model: Could an effective intersectoral health system be coordinated remotely or virtually by government public health infrastructure located outside the region? Could an efficient system delegate the central coordinating responsibility to another governmental convener, or perhaps to the private sector? Who decides the geographic boundaries covered by an intersectoral health system, and the optimal distribution of its assets? A ground-up, comprehensive view of all the region's assets reveals potentially relevant and powerful actors across sectors at the local level different from the "powerful actors" previously articulated by the IOM.[3] Local iteration of the IOM concept will facilitate practical translation and wider application to health system–building efforts.

Information science offers a framework for systematic analysis of a conceptual model that considers 3 key qualities: syntax, semantics, and pragmatics.[27] Syntactic quality entails consistent language; this study found inconsistent and overlapping nomenclature for sectors named in the IOM and WHO literature. Semantic quality is assessed by how well the model reflects reality. Comparison of the conceptual representation and description of the IOM intersectoral health system partners (Appendix C, panel A) to empirical findings in the study region (panels B and C) reveals substantive differences. Pragmatic quality assesses the comprehensibility and use of the model by the intended users. Our local effort to apply and refine the model generated a nomenclature convention and a taxonomic tool that could be used to harmonize model iteration, implementation, and evaluation across locales. To promote dissemination of the model, the IOM (now the National Academy of Medicine) might design a proactive strategy to systematically observe or gather feedback on its translation by community-level end users.

This study quantified sectors by the number of public-facing sites identified. Other characteristics, such as tax revenue, stability, political influence, workforce size, and quality, were not assessed but are likely important for planning an intersectoral health system. This study did not address the optimal distribution of assets for population health improvement; rather, the poor health outcomes of the study region's population suggest that the current distribution may not be optimal. Work is under way to quantify accessibility, quality, and demand for the region's assets. The findings were limited by edge effects; potentially important assets beyond the census boundary were not identified. Although the methods, nomenclature conventions, and functional sector taxonomy probably generalize to other settings, our findings specific to assets and sectors in an urban geography with a single, centrally located tertiary care academic medical center may differ across rural, suburban, tribal, and other locales.

## PUBLIC HEALTH IMPLICATIONS

Among public health and medical practitioners, the idea of "intersectoral health" is described more generally as building "a culture of health," or "clinic-to-community linkages."[28–32] In our effort, supported in part by a Health Care Innovation Award from the Center for Medicare and Medicaid Innovation (https://innovation.cms.gov), we have been building information infrastructure to "connect health care to self-care."[9,33,34] Providers, especially those working in low-income areas, are aware that factors such as unemployment, poor-quality food, and unstable housing threaten individual and population health, but they often feel ill-equipped to address these needs.[35] Information systems, including high-quality data about local assets, common language, and shared operating principles, serve as formative, basic building blocks to translate the intersectoral health system solution from aspiration to action. Engaging youths in the process cultivates a future citizenry and workforce attuned to the importance of community assets across sectors for health.[20,25]

To improve population health, policy and infrastructure must align to engage partners across sectors in the collective work of building functional intersectoral systems. Carefully considered conceptual models will realize their greatest value when applied using consistent terms and understood within the nuances of local context. This study provides nomenclature and a taxonomy that can be used across communities to operationalize the concept of intersectoral health and offers inspiration to other communities to engage youths as key stakeholders. Ultimately, intersectoral health will be a transformative concept when it can be translated into action on the ground. AJPH

### CONTRIBUTORS

S. Tessler Lindau, K. Diaz Vickery, J. Makelarski, A. Matthews, and M. Davis contributed to the drafting of the article. All authors contributed to the concept, design, analysis, and interpretation of the data, contributed to revision of the article for important intellectual content, and approved the final version of the article.

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## HUMAN PARTICIPANT PROTECTION

No protocol approval was necessary because human participants were not involved in this study.

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