Safety-Net Definitions
Illustrative Examples and Preliminary Findings from Systematic Review

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Summary
A systematic review is underway to glean insights about definitions used to define safety-net settings across the health care continuum. This report offers descriptions of approaches used in illustrative examples drawn from publications identified in early steps of the systematic review. Definitions from these examples can be categorized under a framework that includes population-level definitions (based on characteristics of patients or populations receiving care), institution-level definitions (based on characteristics of the organizations providing care), area-level definitions (based on characteristics of defined geographic areas), and other definitions. The framework will undergo additional review and iteration in the process of continuing and completing the systematic review.

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Introduction

This document includes preliminary findings from a systematic review of peer-reviewed publications addressing care in safety-net settings. The purpose of the systematic review is to glean insights about definitions used to define safety-net settings across the health care continuum. Within that goal, this report offers illustrative examples and descriptions of approaches used to define the safety-net, drawn from publications identified in early steps of the systematic review.

Systematic Review

A systematic literature review was conducted to evaluate existing definitions of safety-net settings in peer-reviewed publications. Institutional librarians at two sites (University of Texas Southwestern Medical Center, University of Pennsylvania) were consulted to develop a comprehensive master search string and search of titles, abstracts, and keywords that encompassed terms such as *safety-net provider* as well as safety-net institutions and settings (*hospital*, *clinic*, *health care*, *healthcare*, *care*, *institution*, *medical care*, *organization*, *system*, *facility*, and *practice*). This string was used to search PubMed, which returned 3,456 results, as well as Ovid Medline, which return 3,458 results. After filtering 3,449 duplicates between PubMed and Ovid Medline results, 3,464 unique publications were identified for review.

Based on review of titles and abstracts for these 3,464 publications, 249 were excluded and 3,215 were advanced for full text review. We categorized each of these 3,215 articles into 1 of 3 categories.

Explicit Definition. Some publications contained information with an explicit definition of safety-net providers.

Implicit Definition. Some publications did not directly provide a safety-net definition but were organized in ways that assumed a definition of safety-net institutions.

Mention. Some publications made at least 1 mention of the safety-net (e.g., a study being conducted "in a safety-net setting") while focusing on a range of clinical, educational, or other topics. These articles were included for the sake of comprehensiveness.

Definitional Framework

For this report of preliminary findings, we focused on articles within the *explicit* and *implicit* categories – collectively representing approximately 1/3 of all publications – and created a framework for safety-net definitions. The framework was based on our team's domain expertise and collateral insight from prior work. This framework organizes safety-net

definitions into (1) patient population-level definitions; (2) institution-level definitions; (3) area-level definitions; or (4) other definitions.

Patient population-level definitions operationalize the safety-net based on characteristics of patients or populations receiving care. Characteristics can include the following:

- Demographic information (e.g., race, ethnicity, immigration status)
- Insurance status (e.g., enrolled in Medicaid; dual-eligibility for Medicare and Medicaid; uninsured)
- Socioeconomic (e.g., low-income, “indigent”)

Institution-level definitions are based on characteristics of the organizations providing care. Characteristics can include the following:

- *Amount of uncompensated care delivered or receipt of financial assistance for uncompensated care*. Uncompensated care is typically assessed as a component of an organization’s operating expenses. Components of uncompensated care could include charity care, bad debt, or shortfalls from specific payers (e.g., Medicaid) relative to others

Types of financial assistance can include Disproportionate Share Hospital (DSH) Payments through either the Medicare and Medicaid programs or both, public ownership or funding received as County or Public Hospitals, funding through local health departments, and funding through other mechanisms (e.g., local tax revenues, upper payment limit payments).

- *Measures of financial health*. Such measures could include operating margins, financial reserves, access to capital, and profit status.
- *Formal designation from external groups*. For hospitals, this could include specific designations established by groups such as the Centers for Medicare & Medicaid Services. Hospital designations include Critical Access Hospitals or Sole Community Hospitals, while ambulatory care site designations include Federally Qualified Health Centers, Rural Health Clinics, Community Health Centers, or Charity Care Clinics.

Area-level definitions operationalize the safety-net based on characteristics of defined geographic areas. These definitions are distinct from patient population-level definitions in that they focus on characteristics of overall populations in specific geographic area types (e.g., county, census-based geographical unit) rather than characteristics of individuals comprising specific patient populations or served by specific institutions. Area-level

definitions can also include composite indices designed to capture elements of social disadvantage (e.g., Area Deprivation Index, Social Vulnerability Index).

Other definitions operationalize the safety-net based on a variety of other criteria. These included conceptualizations based on broad missions of organizations (e.g., to serve the poor), academic designation (e.g., academic medical center) with or without the use of formal definitions of academic institutions (e.g., accreditation status), affiliation (e.g., clinics that are part of safety-net hospitals or systems), cost of receiving care (e.g., free or student-run free clinics), or the type of conditions or care delivered (e.g., clinics providing care for sexually transmitted diseases through the Ryan White Program).

Considerations

Categories from this framework are not meant to be mutually exclusive. Frequently, prior research has combined different elements into composite or multi-component definitions. Components may be collinear or otherwise relate to each other. For instance, definitions based on formal institutional designations may relate to area-level definitions of need (e.g., criteria for FQHC designation and funding from the Health Resources and Services Administration based in part on location in a medically underserved area); definitions based on receipt of financial assistance can relate to patient populations receiving care (e.g., DSH payment criteria being based in on share of patient days for which Medicaid is

primary payer). Additionally, our framework also recognizes that definitions may determine safety-net status based on thresholds (e.g., percent of individuals in a population receiving care; percent of financial assistance received, percentile thresholds for national or state-specific distributions on measures such as DHS index).

PRELIMINARY FINDINGS

Below we provide illustrative examples organized by our proposed safety-net definitional framework (Table).

Patient Population-Level Definitions

Several publications defined safety-net institutions based on patients' insurance status. Medicaid populations were commonly used for this purpose,[1-4] calculated as a share of all patients (e.g., >50% Medicaid patients receiving in a clinic); Medicaid inpatient days relative to total inpatient days in a hospital) or assessed in the context of Medicare/Medicaid dual-eligibility (e.g., top quintile threshold for proportion of dual-eligible patients receiving care).[5] Uninsured populations were also commonly used in safety-net definitions, captured through uncompensated care costs (see *Institution-Level Definitions* below).

One publication noted the historical roots of hospitals as entities built for the poor and organized as charities[6] while another publication extended key populations served by safety-net institutions beyond Medicaid and uninsured populations to "a broader array of vulnerable populations, including persons with acquired immunodeficiency syndrome (AIDS), substance abusers, the frail elderly, low-income children and pregnant women, the homeless, and the mentally ill."[7]

Other publications defined safety-net based on specific clinical populations. For instance, in an analysis of factors associated with survival after colon cancer, safety-net hospitals were defined based on "the proportion of the patient population … that is uninsured or on Medicaid" for colon cancer cases only, not all cases and patients receiving care across a given hospital.[8] Hospitals were stratified by quartiles into high safety-net burden (highest quartile), low safety-net burden (lowest quartile) and medium safety-net burden (intermediate quartiles).

Institution-Level Definitions

Some publications defined safety-net based on the characteristics of organizations providing care. One approach was based on the amount of uncompensated care expenses. For instance, some publications[4,9-11] assessed hospital expenses associated with uncompensated care as a combination of charity care costs and bad debt expenses,

using this amount either directly or in transformed format (e.g., uncompensated care costs as ratio of operating expense percentage; uncompensated care charges relative to total charges) to define safety-net hospitals. Some of these publications used top decile thresholds for uncompensated care costs were used to identify hospitals devoting the most significant resources to such services, reflecting the idea that "indigent patients make up a large share of these hospitals' patient populations by virtue of the high percentage of their expenses that are uncompensated."[10]

Another approach was to define safety-net institutions based on DSH payments as forms of financial assistance for uncompensated or undercompensated care.[5,6] One publication used Medicare DSH index and a top quartile threshold to define "High-DSH" hospitals as safety-net institutions.[12] Another publication[3,13] used state-level DSH criteria, which defined "DSH hospitals" as those with a sum of certain patient charges (Medicare, Medicaid, other governmental payers, free care) equaling 63% or more of total hospital charges, and incorporating additional state-specific criteria (e.g., designating hospitals receiving support from Medicaid DSH and Upper Payment Limit programs as "Major DSH hospitals"). Other publications used DSH patient percentage and applied percentile thresholds (e.g., top quartile) to define safety-net versus non-safety-net hospitals.[14-16]

Yet another approach was to define safety-net based on ownership type or designation by external groups. Some publications[2,5,7,12] identified public hospitals, which are typically operated by local, county, or state governments, as safety-net institutions in part due to requirements that they provide care to all individuals. One publication defined public hospitals as a core safety-net provider, with inpatient services (e.g., admissions) and outpatient services (e.g., outpatient, emergency department visits) serving as safety-net related measures.[17]

Another publication noted as well-accepted fact that community health centers and local health departments are considered "core safety-net institutions."[7] In another example, clinics located in rural areas that achieved certification from the Centers for Medicare and Medicaid Services as "rural health clinics" were deemed safety-net providers. Such rural health clinics were compared to other rural, non-safety net providers (that is, clinics in rural areas that did not achieve the rural health clinic designation) with respect to new Medicaid patient acceptance.[18]

Other publications were more implicit in defining safety-net via formal designations from external groups. For example, safety-net was designated as a keyword or focus of study in multiple publications on federally qualified health centers that lacked explicit definitions of safety-net status.[19,20] Instead, some of these publications described the role of these

centers in treating groups such as “the medically underserved” and “the most vulnerable,” while other publications made no such mention at all.

Area-Level Definitions

Some publications defined safety-net based on characteristics of populations within general geographic areas. For instance, one publication quantified 5 measures of safety-net – federally supported community health center services; locally supported safety-net services; public hospital inpatient services; public hospital outpatient services; and services for the uninsured measured through uncompensated care – and combined them into an index at the level of Metropolitan Statistical Area.[17]

Other publications operationalized area-level measures of safety-net based within health care-oriented geographical areas. For example, in one publication, four measures were identified to reflect hospital admissions from areas inhabited by populations with low socioeconomic status: (a) percentage of population 25 years or older without high school diploma; (b) percentage of racial or ethnic minority residents (African-American, Native American, Non-Black Hispanic); (c) median household income; and (d) percentage of residents with incomes below the poverty line. Population-weighted versions of these measures were aggregated at the level of Hospital Service Area (a geographical unit meant

to capture where hospitals draw the bulk of their patients from and operationalized as a collection of ZIP codes cumulatively accounting for 75% of a hospital's discharges).[4]

Notably, area-level measures could also include institutional, rather than patient population, characteristics. Some publications operationalized safety-net hospitals as those with high market shares for uncompensated care (based on hospitals' adjusted market share for uncompensated care across its metropolitan statistical area). This area-level definition was created to reflect the idea that safety-net hospitals are those that are critical "in their communities by virtue of their large adjusted market share of uncompensated care."[9,10]

Other Definitions

One publication invoked the safety-net based on institutional mission and "a mandate to serve the poor" without further elaboration.[21] Some publications operationalized safety-net based on type of conditions or care delivered. For example, one study[22] assessed insurance coverage utilization among patients receiving services at a single sexually transmitted disease (STD) clinic, describing it as "as a safety-net provider of STD care for the entire state". The publication noted how the clinic cared for populations that included the uninsured without an explicit definition connecting uninsured populations to safety-net designation.

Multiple publications connected safety-net with academic institutions. Some publications noted "inner-city teaching hospitals" as core safety-net institutions that "assuredly provide a great share of services to the poor"[7] while other publications that observations from an Institute of Medicine panel that "teaching hospitals fulfill the role of safety net hospitals in many communities."[17]

Publications also pointed to historical roots underlying this connection, dating back before the 1960s when "residents gained their primary clinical experience in public hospitals and on the charity wards of voluntary hospitals" and in public hospitals "where medical education programs have provided a workforce for care of indigent patients".[6] As a result, "many [viewed] support for GME as support for uncompensated care in underserved communities."

Definitional Considerations

Our review revealed several considerations related to safety-net definitions. One was the process of translating theoretical constructs into tangible definitions. For instance, some publications invoked work from a 2000 Institute of Medicine (IOM) committee, which defined the health care safety net as "those providers that organize and deliver a significant level of health care and other related services to uninsured, Medicaid, and other vulnerable

patients."[24] The committee noted that "core safety-net providers" existed in many communities and could be defined using the presence of two characteristics:

- "open door" access for patients regardless of ability to pay, either by legal mandate or by explicitly adopted mission; and
- a substantial share of patients who are uninsured, insured through Medicaid, or otherwise vulnerable

One publication emphasized the characteristic of open door access by defining individuals with government-sponsored insurance or lack of insurance (e.g., "naturally, a substantial share of patients treated at safety-net hospitals have government- sponsored insurance or are uninsured").[8] Another publication emphasized the characteristic of having "a mandate to serve the poor" but without further elaboration about how that was assessed.[21]

Other publications noted IOM definitions for safety-net providers (those "organized to deliver 'significant' levels of health care and other related services to indigent patients") and defined significance from hospital perspectives (significant share of hospital resources expended on care) as well as community perspectives (significant share of indigent populations in the community receiving care). These measures were then used in different combinations to capture variation among safety-net institutions.[10]

Another consideration was the potential for different definitions to lead to different hospitals receiving safety-net designations. One publication[25] compared characteristics of safety-net hospitals under three different measures: (1) Medicaid and Medicare Supplemental Security Income inpatient days historically used to determine Medicare Disproportionate Share Hospital payments; (2) amount of care provided to Medicaid and uninsured individuals; and (3) uncompensated care expenses. Using top quartile thresholds to define safety-net hospitals, these 3 measures identified different sets of hospitals (different characteristics and financial circumstances).

A third area of definitional consideration was variation in the mix of services provided through safety-net institutions across different regions. As noted in one study[7]:

> *"There also are substantial differences in the breadth of mental health, chemical dependency, and health-related social services. The service mix in a given community is closely related to that community's history and expectations. In some, such as San Francisco, Minneapolis, Boston, and New York, a wide array of population based and personal care services has traditionally been considered essential. In others, such as Phoenix, Syracuse, and Orange County, California, the*

provision of basic emergency, clinic, and inpatient care seems to be generally viewed as the safety net.”

To the extent that services differ across geographies, variation could affect patient populations receiving care – and in turn, applicability of safety-net definitions in different areas. For instance, in a publication assessing perioperative protocols for joint arthroplasty, nearly 40% of safety-net hospitals (defined by a mandate to provide care for the poor) did not offer joint arthroplasty “due to lack of surgical personnel, resources, and institutional support.”[21]

CONCLUSION

Illustrative examples from work conducted thus far as part of a systematic review demonstrate approaches described by a definitional framework that categorizes safety-net definitions into patient population-level, institution-level, area-level, and other definition types.

We describe a framework to categorize safety-net definitions into patient population-level, institution-level, area-level, and other definition types, proving illustrative examples of from the peer-reviewed literature. The framework will undergo additional review and

adjustment in the process of continuing and completing the systematic review.

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Table. Illustrative Example Publications

Year	Article	Hosp vs Amb	Definitions				Notes
			P	I	A	O	
1997	Fishman LE & Bentley JD. Health Affairs	Hosp	X	X		X	Described origins of US hospitals as charities build primarily for the poor. Discussed Medicare and Medicaid DSH payments, as well as nonfederal support (e.g., state, county, city tax dollars), as forms of financial assistance for uncompensated care. Noted GME funding as another avenue for supporting the safety-net (given the intertwined history of medical education and care for the poor)
1997	Baxter RJ & Mechanic RE. Health Affairs	Hosp	X	X		X	Discussed urban public hospitals, community health centers, some inner-city teaching hospitals, and local health departments as generally accepted core safety-net institutions; noted that beyond Medicaid and uninsured populations, safety-net institutions care for a broader array of vulnerable populations
1997	Fishman LE. Health Affairs.	Hosp		X			Defined safety-net based on the proportion of hospital expenses that were uncompensated (top decile of ratio between uncompensated care costs and operating expense percentage)
2001	Zuckerman S, et al. Health Affairs	Hosp		X	X		Defined safety-net based on portion of hospital expenses that were uncompensated (top decile threshold for large portion) and market share for uncompensated care within metropolitan area (at least double expected share based on hospitals within an area).
2004	Marquis MS, et al. Medical Care	Hosp + Amb	X	X		X	Defined safety-net based on 5 measures meant to encompass core safety-net providers adopted by IOM: (1) federally supported community health center services; (2) locally supported safety-net services; (3) public hospital inpatient services; (4) public hospital outpatient services; and (5) services for the uninsured (measured through uncompensated care). Included teaching hospitals as safety-net based on IOM. Created MSA area-level index summing across 5 measures (index range 5-20)
2006	Bazzoli GJ, et al. Health Services Research	Hosp		X	X		Defined safety-net based on portion of hospital expenses that were uncompensated (top decile threshold for large portion) and market share for uncompensated care within metropolitan area (at least double expected share based on hospitals within an area). Distinguished between core safety-net hospitals (meeting both I and A criteria) versus voluntary safety-net hospitals (those meeting I or A criteria but not both)

2008	Zwanziger J & Khan N. Medical Care Research and Review	Hosp	X	X	X		Defined safety-net based on (1) SES index meant to reflect admissions from areas of low SES populations [HSA-level composite of (a) percentage of population 25 yrs or order without high school diploma; (b) percentage of minority residents (AA, NA, NBH); (c) median household income; (d) percentage of residents with incomes <poverty line); values were area mean-adjusted; index normalized to 0-1]; (2) Medicaid Intensity (proportion of admissions insured by Medicaid; values were area mean-adjusted); or (3) uncompensated care burden (proportion of total charges attributable to uncompensated care charges)
2011	Mobley L, et al. The Open Health Services and Policy Journal	Hosp	X				Defined safety-net based on either public hospital status or Medicaid Intensity (share of inpatient days covered by Medicaid) in each state calculated separately for urban and rural hospitals (mean + 1SD threshold)
2014	Gilman M, et al. Health Affairs	Hosp	X				Defined safety-net based on Medicare DSH patient percentage (top quartile threshold)
2014	Bazzoli GJ, et al. Health Affairs.	Hosp	X	X			Defined safety-net based on non-profit status (for-profit excluded from safety-net designation) and Medicaid patient share (Medicaid inpatient days/Total inpatient days; mean + 1SD threshold)
2014	Bazzoli GJ & Clement JP. Journal of the Poor and Underserved.	Hosp		X			Defined safety-net using state-specific (MA) DSH criteria: sum of charges from Medicare, Medicaid, other govt payers, free care >63% total hospital charges. Among these “DSH hospitals”, 2 (BMC, CHA) were deemed “major DSH hospitals” due to special supplements through Medicaid DSH and UPL programs.
2015	Gilman M,et al. Health Affairs	Hosp		X			Defined safety-net based on DSH patient percentage (top quartile threshold)
2015	Gilman M,et al. Annals of Internal Medicine	Hosp		X			Defined safety-net based on DSH patient percentage or UCC payment per bed (top quartile threshold for both as main analysis; top decile threshold as sensitivity analysis)
2016	Richards MR, et al. Health Services Research	Amb		X			Defined safety-net as clinics in rural areas that achieve CMS certification as “rural health clinic”

2016	Bolen SD, et al. Primary Health Care Research & Development.	Amb	X				Defined safety-net based on proportion of patients on Medicaid or uninsured
2017	Figueroa JF, et al. Medical Care	Hosp		X			Defined safety-net based on DSH patient percentage (top quartile threshold)
2017	Montgomery MC, et al. Sexually Transmitted Diseases	Amb				X	Discussed STD clinic providing care to uninsured populations without safety-net definition
2018	Lavelle TA, et al. BMC Health Services Research	Amb		X			Discussed FQHCs without safety-net definition
2018	Bazzoli GJ, et al. Health Services Research.	Hosp		X			Defined safety-net based on (a) Medicare DSH index (top quartile threshold) or (b) ownership (public hospitals)
2018	Bernstein DN, et al. The Archives of Bone and Joint Surgery	Hosp				X	Defined safety-net based on hospitals with a mandate to serve the poor (no further elaboration)
2019	Popescu I, et al. JAMA Network Open	Hosp	X	X			Compared hospitals identified as safety-net providers using three definitions: (1) Medicare DSH index; (2) Medicaid and uninsured caseload (proportion of hospital days accounted for by Medicaid and uninsured hospital days); (3) costs of uncompensated care (charity care + bad debt) as a proportion of operating expenses
2020	Choi S, et al. Journal of Health Organization and Management.	Amb		X			Discussed FQHCs as “a core safety net health services provider” without explicit safety-net definition

2021	Hrebinko KA, et al. Journal of Surgical Research	Hosp	X				Defined population by specific clinical condition; separate hospitals by extent of “safety net burden” (quartile threshold)
2022	Hsuan C, et al. BMC Health Services Research	Hosp	X	X			Defined safety-net based on (a) Medicare DSH patient percentage (top quartile threshold); (b) public ownership status; (c) and Medicare/Medicaid dual-eligibility (top quintile threshold)

Notes: A=area-level definition. AA=African American. DSH=Disproportionate Share Hospital. FQHC=Federally Qualified Health Center. HSA=Hospital Service Area. I=institution-level definition. IOM=Institute of Medicine. MSA=Metropolitan Statistical Area. NA=Native American. NBH=Non-Black Hispanice. O=other definition. P=patient population-level definition. SES=Socioeconomic Status. STD=Sexually Transmitted Disease. UCC=Uncompensated Care. UPL=Upper Payment Limit.