Connecting Communities with Data: A practical guide for using electronic health record data to support community health

Version 1.0

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DEPARTMENT OF HEALTH

Connecting Communities with Data: A practical guide for using electronic health record data to support community health – Version 1.0

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Introduction and purpose

Minnesota's communities are recognizing the potential to collaborate across clinical care and local public health to improve the health of all people in their communities. Local health departments and hospitals have a common need to develop actionable and outcomes-oriented community health assessments. Additionally, Minnesota health plans are required to create a "collaboration plan" describing how the organization will collaborate with community health boards and other organizations to achieve public health goals in the communities they serve (see Figure 1). Traditional data sources for these activities and assessments often do not provide the granularity or timeliness to support this need.

Figure 1. Community Health Assessment Tasks by Sector in Minnesota

	Health Plans	Hospitals & Health Systems	Public Health
Frequency	Every 4 years	Every 3 years	Every 5 years
Requirement	Minn. Stat. 62Q.075	Affordable Care Act	Minn. Stat. 145A
Reporting	MN Dept of Health	IRS, Form 990 Schedule H	MN Dept of Health
Availability of collaborative process models or toolkits		ACHI Toolkit, Catholic Hospital Association Assessing CH Needs	MAPP, University of Kansas Community Toolbox
	Describe target population/audience		
	Develop an assessment plan		
	Partner with other community sectors		
	Review primary and secondary data		
	Collect quantitative and qualitative data		
	Analyze data		
	Seek community input		
	Identify health priorities		
	Describe causes that contribute to the identified health issues		
	Describe existence and extent of health disparities between community populations		
	Describe community assets and resources available to address priority health issues		
	Inform partners and community organizations about the assessment		
	Communicate findings to the public		
	Monitor and update findings on an ongoing basis		
	Create implementation or action plan to address priority health issues		

*Although individual health plans do the tasks listed under community health assessment for their organizations, it is not a requirement of the collaboration plan. Health plans work with local public health and hospitals on community health assessments through collaborative projects.

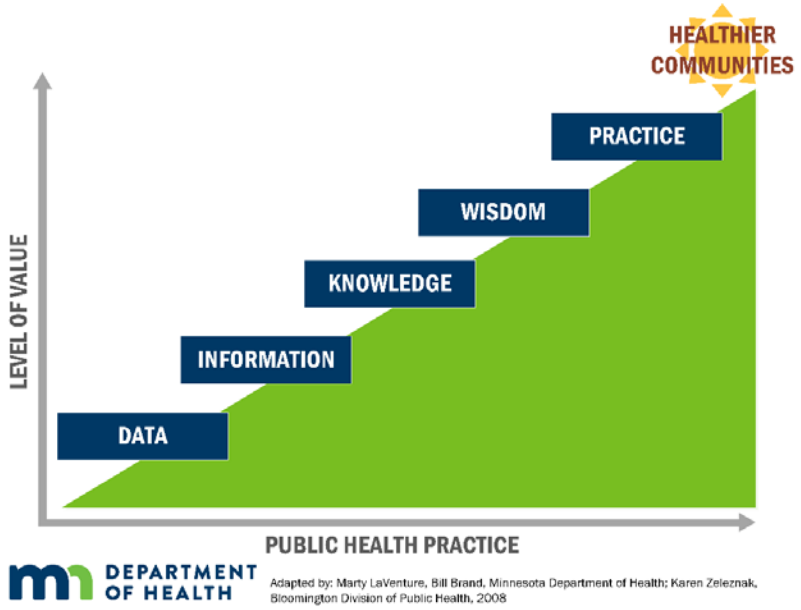
Source: Center for Community Health, July 2017

Data housed within electronic health records (EHRs) have the potential to provide a more complete, longitudinal view of a patient in addition to more timely data on subpopulations, geographic areas, and health conditions that are typically underrepresented in traditional

surveillance methods (Tomines et al., 2013). While EHR data face challenges including inconsistent data quality and incompleteness of population coverage (Paul et al., 2015), there is great potential for information derived from EHRs to benefit the health of communities (Friedman et al., 2014). EHR data combined with public health data have the potential to help local public health and providers identify high risk areas and sub-populations, target interventions to vulnerable populations, monitor the impact of such initiatives over time, and overall inform population health assessments.

With EHR adoption nearly universal in Minnesota clinics (98%) and hospitals (100%),[1] there is a significant increase of the amount and type of data at varying levels of sophistication available for use. Providers and local public health can work together to acquire, manage, and use these EHR data beyond clinical use to create knowledge about issues in the community to encourage action. Various models for optimizing the use of data based on the EHR system are briefly described in this section followed by more details described as a framework for any community to adopt.

Figure 2. Using Informatics to Improve Public Health Practice



The purpose of this document is to share the stories and experiences of three pioneering collaborations between local public health and health care that are using EHR and public health data to improve the health in their community. Included in this document are their lessons learned and tools to encourage the movement of data to knowledge, and furthermore, knowledge to practice to improve community health (see Figure 2). This is also a goal recognized as important by the Public Health 3.0 initiative[2] and the recommended practices of achieving a more informatics-savvy organization.[3]

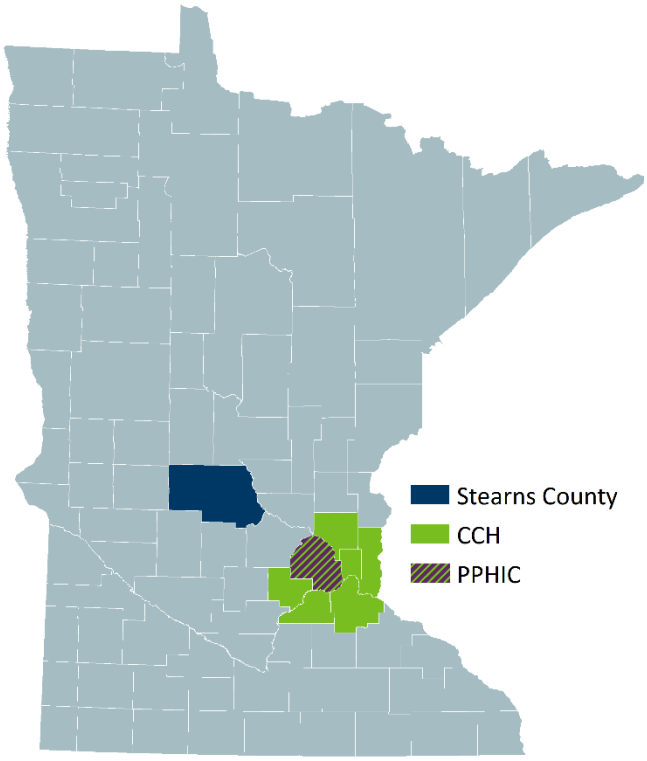
Stories from the field

Below are three pioneering examples of collaboration between local public health and health care providers in Minnesota to share and use EHR data and information (see Figure 3). Their

[1] http://www.health.state.mn.us/e-health/assessment/index.html
[2] https://www.healthypeople.gov/sites/default/files/Public-Health-3.0-White-Paper.pdf
[3] https://www.phii.org/infosavvy

stories serve as practical guidance to help any community begin this process. See Appendix F for additional information about other emerging and existing collaborations around the state doing similar work.

Figure 3. Three featured Minnesota collaborations



Central Minnesota: Find your champion

Introduction and purpose: Upon the start of their first Community Health Improvement Plan (CHIP), Stearns County Public Health reached out to hospitals in the county to learn more about their work, data needs, and how they could work together. To find the right hospital contacts, the public health director consulted with public health's emergency preparedness contact who had existing rapport with local providers. Upon making these connections and convening to discuss, it was established there was interest in collaborating around a regional, multi-county behavioral risk factor survey. The hospitals planned to use the data from this survey to inform their Community Health Needs Assessment (CHNA) and local public health would use it primarily to inform their Community Health Assessment (CHA) and CHIP. Previously, the local public health department surveyed their community around opinions but never around behavioral risk factors. Ultimately, five counties and five hospitals agreed to jointly fund and administer the survey. The results of the first multi-county survey indicated an unusually high rate of smoking among women in the county, so the local health department consulted with a local provider, CentraCare Health, to investigate this anomaly using EHR data. This lead to the first use of provider data to validate survey data and identify zip codes of higher smoking rates to target outreach. It also laid the ground work for a request from Stearns County to CentraCare Health for a Health Equity Data Analysis (HEDA) project for the State Health Improvement Partnership (SHIP) related to diabetes risk factors in a geographic area of Stearns County.

Methods: CentraCare Health initially used EHR data to validate the survey data related to smoking rates and used the zip code data to assist public health in targeting outreach to women. In a subsequent request, they agreed to pull EHR data from a particular clinic in the area to examine health-related data in a western geographic are of Stearns County, including additional chronic disease data to provide context. Stearns County received de-identified data from the provider in Excel files by year, including the following indicators: tobacco use, BMI,

hypertension, heart disease, diabetes type 1 and 2, and prediabetes. These data were used to focus SHIP interventions around targeted communities with high risk factors and continued State Innovation Model (SIM) work with area providers to improve clinical care and follow up with these targeted communities.

Findings: CentraCare Health EHR data were comparable to the regional survey results. The local public health department used these data to launch a targeted anti-smoking media campaign. As a result of the joint survey effort, a strong relationship was formed between Stearns and CentraCare Health, and it served as a launching point for further collaboration. The Stearns Public Health Director and a CentraCare Health champion have maintained monthly meetings and have found additional opportunities to collaborate.

Critical Success Factors: Finding a provider champion, building strong relationships, and sharing resources were key to the success of this collaboration.

7-County Metro: Build community partnerships

Introduction and purpose: The Center for Community Health (CCH) is a seven-county metro area collaboration between 10 public health departments, seven health plans, and 18 hospitals (see Appendix F for additional details). Their mission is to align the population health assessment process across the participating Minnesota metro region, address priority issues through collaborative action plans, and increase overall organizational effectiveness. Under the guidance of the CCH collaborative, a health system (HealthEast) and a local public health department (Dakota County) collaborated to pilot the use of EHR data to enhance general health surveillance, specifically around root causes of obesity. See Appendix B for CCH's draft framework of indicators, including five that are sourced from EHR systems.

Methods: The partnership established data definitions and rules around an initial set of variables that align with population health measures, including percentage of patients who were overweight or obese and percentage of patients who used tobacco. To pilot this concept, HealthEast mapped BMI data for patients from its primary care clinics by zip codes and then over-laid additional demographic information that included age, race, ethnicity, and preferred language.

Findings: The pilot allowed the collaborative to identify and map individuals with high health needs, including high BMI. This revealed geographic concentrations of obesity and has allowed and HealthEast to get a better understanding of the root causes of obesity at a neighborhood level, such as access to healthy foods. The results from this collective effort have been validated by community partners and have prompted more informed discussions on how best to address this pervasive health challenge. Additional de-identified EHR metrics, such as hemoglobin A1C, adult mental health screening, and colorectal cancer screening are currently being piloted to get a better understanding of how these health issues affect various populations within our community.

Critical success factors: Establishing a shared vision around indicators and identifying a champion from within the health system was paramount to the success of this collaboration.

Hennepin County: Establish a common need and share resources

Introduction and purpose: The Private/Public Health Informatics Collaborative (PPHIC) is a partnership between multiple local public health departments within Hennepin County (Minnesota's largest county serving 1.2 million people), and five health systems serving residents in Hennepin County. PPHIC works closely with the aforementioned CCH collaboration. The project's aim is to share EHR data from these providers, specifically around non-reportable diseases and conditions (e.g., diabetes), to produce timely estimates of health status indicators to support program and policy evaluation. The project vision was a result of partnerships established in the Hennepin County Community Health Improvement Plan (CHIP) started in 2011.

Methods: Because multiple health systems are involved in this collaborative, a common data dictionary needed to be established. Despite widely used interoperability data standards, there is variation in EHR data between health systems and EHR vendors. To ensure comparability between variables, the collaborative created a crosswalk elaborating how data are stored, defined, and collected by provider. This crosswalk was used to develop a common definition of variables, for example race, ethnicity, and tobacco user (see Appendix C). PPHIC's approach involves sharing data and consolidating it into a single limited dataset, managed by Hennepin County Public Health Department, with patient identity and health system de-identified. Once aggregated, the dataset will be shared and analyzed by all three public health departments in Hennepin County.

Findings: The collaborative is currently drafting and finalizing data use agreements (DUA) (see Appendix D for an example) before acquiring a limited data set from each provider and assessing the EHR data quality.

Critical success factors: Local public health leveraged relationships formed with health systems following their 2011 CHIP. With the requirement that both health systems and public health departments complete community health assessments, working together to share data has been a driver in this project. Additionally, public health offered the collaborators county-wide and subpopulation reports to encourage project buy-in. Next steps include finalizing and signing the DUAs as well as piloting and finalizing the data dictionary and submission guide. The goal is to obtain 2016 EHR data in 2017 to begin analysis.

Getting started

Figure 3. Toolkit components summary

These stories provide valuable lessons learned and key elements for action, which can be broken into a framework of four main components (see figure 3).

Following these basic components will help start your organization on the path to using EHR data and information to improve community health. However, depending on the current state and needs of your organization, these components may be addressed in a different order, concurrently, and/or iteratively. This toolkit is intended to be a guide and starting point; information provided will evolve as the field of EHR data use for community health improvement advances.

Each component is described here with a brief background, considerations, tools, and resources.

1. Inventory data resources

EHR data can complement existing public health surveillance methods and help set priorities. For example, Hennepin County Public Health will continue utilize the SHAPE survey,[4] an ongoing public health surveillance and assessment survey of the county, as a means of surveillance and also use the survey results in EHR data validation. The PPHIC project will serve as an additional data source for local public health surveillance. Other complementary sources of data include birth and death records, community indicators (e.g., National Center for Education Statistics), environmental indicators (e.g., DOT traffic data), national data with state and local value (e.g., Behavioral Risk Factor Surveillance System), state data with local-level information (e.g., Minnesota Student Survey), and community-level data with local-level information (e.g., regional surveys).

Considerations

- ☐ Create a list of internal information assets including data sets and information systems. St. Louis County completed an Informatics-Savvy Health Department Self-Assessment, which includes this activity. See the resources below for a link to the assessment.

[4] http://www.hennepin.us/your-government/research-data/shape-surveys

Resources

- See the Public Health Informatics Institute's website for more information about completing an internal inventory of information systems: https://www.phii.org/infosavvy
- For a list of data sources available to public health at the local, state, and national levels, see the Partners in Information Access for the Public Health Workforce website: https://phpartners.org/health_stats.html
- See the Minnesota Department of Health's Center for Health Statistics website for additional resources: http://www.health.state.mn.us/divs/chs/

2. Engage community partners

As found in the stories above, relationships are key to the success of any collaboration to use EHR data. The Stearns County Public Health Director has said, "Data doesn't come from numbers. It comes from relationships." Foundational characteristics to establishing a successful relationship include aligning leadership, mutual trust and respect, and having a shared vision.[5] Aligning leadership may include clarifying roles and having the capacity to initiate and manage change across organizations. Local public health has the unique opportunity to assist health care in participating in broader partnerships and upstream interventions. See the considerations and resources below for specific actions to consider when building partnerships with providers.

Considerations

- ☐ If relationships with local providers are not in place, consider a variety of ways to reach out and begin the conversation. You may find success reaching out to other community members, such as philanthropies and community services, to engage support and provide technical assistance.
- ☐ Find your 'champion' within a provider or health system. Stearns County consulted with their emergency preparedness contact to find an appropriate contact within a hospital.
- ☐ Offer to share existing resources to incentivize a relationship. For example, PPHIC offered to provide county-wide and subpopulation reports on shared indicators to participating health systems.
- ☐ Explore mutual benefit of partnership and common goals. For example, engage hospitals around their CHNA requirement and encourage assessment alignment with public health assessment requirements.
- ☐ Serve as a neutral convener between potentially competitive providers. East Central Minnesota's Community Health Alliance (CHA), (See Appendix F), led by Isanti County's Public Health Director, has convened a multi-county alliance of providers, health plans,

[5] http://www.publichealthsystems.org/sites/default/files/PHS3/71270GPreport_11.pdf

and local public health to encourage sharing and use of community health data and resources to improve community health.

Resources

- To learn more about primary care and public health collaboration in Minnesota, see 'Measuring Variation in the Integration of Primary Care and Public Health': http://www.publichealthsystems.org/sites/default/files/PHS3/71270GPreport_11.pdf
- To foster stakeholder engagement, see AcademyHealth's learning guide and supporting materials: http://www.academyhealth.org/publications/2017-05/power-true-engagement-population-health-learning-guide
- To understand how to foster/optimize multi-sector partnerships, see Pulse Check on Multi-Sector Relationships, a report by ReThink Health, a Rippel Foundation Initiative: https://www.rethinkhealth.org/tools/pulse-check/
- For general information on building partnerships, see:
    - Practical Playbook: https://www.practicalplaybook.org/section/building-partnership
    - PHII's EHR Toolkit: http://www.phii.org/ehrtoolkit/forming-partnerships

3. Assess capacity to use EHR data and information

EHR data background

Data and information within EHR systems provide new opportunities to monitor population health at the local level in a more timely and granular way than allowed by traditional surveillance methods. Additionally, they circumvent the self-report bias present in surveys and can be relatively inexpensive data to obtain (Thorpe et al., 2016). Uses for EHR data and information can include identifying community needs, informing CHA and CHIP processes, identifying disparities, engaging community stakeholders, supporting targeted strategic planning, measuring progress toward desired goals, promoting health in all policies, targeting services to populations, planning new services, and surveilling community health.

Some limitations remain to using EHR data for population health improvement:

- EHR data represent a convenience sample of patients that are seeking care, therefore eliminating those with no medical encounters (Romo et al., 2016).
- Patient duplication is an issue, but can be managed by well-constructed population definitions (see Appendix A).
- The body of literature about how to define, collect, and interpret EHR data for population health monitoring is relatively new. However, literature indicates EHR-based data can produce acceptable estimates of chronic diseases indicators (McVeigh, 2016).

- EHR vendors capture and manage differently, so crosswalks are needed to compare indicators across systems if more than one provider is involved.
- Some local health departments and providers face a resource capacity issue, specifically around analytic resources. This limitation can be addressed with assistance from either a provider, state health department, or other community partner.
- There are issues with EHR data quality including problems with consistent data entry into appropriate discrete fields and inability to extract standardized information from robust provider notes. There is no silver bullet solution to addressing EHR data quality issues, but this is a known problem and many organizations are considering remedies. Data should be examined to understand how much data are missing or non-standardized. Additionally, data can be compared to other sources including surveys to estimate validity.

Information vs data

There are many ways to share and use EHR data and information. For example, a provider may share an aggregate report of information that may not require a data use agreement (DUA) (see Appendix D for example) or memorandum of understanding (MOU). On the other hand, a DUA might be needed to share a limited data set of indicators, particularly if receiving individual records vs aggregated data. Records from the EHR system can either be received in aggregate reports (otherwise referred to as 'information' in this document) or de-identified or limited data sets (otherwise referred to as 'data'). Limited data sets contain potential protected health information (PHI) such as zip code, city, and county indicators, while de-identified datasets do not contain PHI. See Appendix J for more thorough definitions.

Receiving ***information*** from a provider may be a great first step to using EHR data for community health improvement. Information sharing likely does not require the creation of a Data Sharing Agreement (DSA) or even a Memorandum of Understanding (MOU). Limitations to receiving information include limited use and manipulation of the information as well as inability to compare indicators across multiple systems.

EHR ***data use*** usually requires DSAs, authorizations, permissions, approval processes, and processing. However, the data made available to the local public health department will be better customized to the health department's needs. Additionally, if multiple health systems are involved, it is more possible to compare variables across systems. In this case, a common data dictionary and data policies need to be agreed upon (see Appendices D and E). There is still variation in EHR data between systems and EHR vendors, despite widely used interoperability data standards. To ensure comparability between variables, the collaborative created a crosswalk elaborating how data are stored and collected by provider (see Appendix C). This crosswalk as well as reviewing established definitions from similar EHR projects such as the NYC Macroscope were used to create a common definition of variables, for example race/ethnicity and tobacco user. PPHIC's approach involves sharing data and consolidating into a single repository with the health system de-identified.

For both information and data use, it is important to define patient population inclusion and exclusion criteria. For example, the patient population will need a defined age range, provider types and settings, visit types, city or county of residence, number of visits, and omission of certain health conditions. Inclusion criteria can help mitigate duplicate patient records, especially across multiple providers. For example, for the adult measures, PPHIC included adults ages 18+ years, those seen by an eligible provider in an eligible specialty face-to-face visit at least one time during the measurement period, and other criteria that mitigated duplicated records (see Appendix A). A pregnancy flag will be created to exclude pregnant women but include women who see an internist and OBGYN for their primary care.

Capacity to use EHR data will depend on available analytic capabilities, whether it's in-house, done by a provider, or contracted. Additionally, necessary capabilities will vary depending on the type of information or data received by the provider.

Information

If information is provided in aggregate form from the provider, data use agreements may not be required. For example, a report may be provided in an Excel spreadsheet and because the report is in aggregate form, extensive security measures are not necessary. Instead, a Memorandum of Understanding could be considered to establish an official relationship. Analytic capability may be needed to run crosstabs and pivot tables in Excel to analyze the data. Analytic capacity should also be evaluated with regard to the ability to accurately interpret and present data. New York City Macroscope receives data in aggregate form, but use statistical expertise to interpret the data (see resources below).

Data

If raw data files from health providers are provided, there are more considerations around data sharing policies and legal considerations.

Data policies

It is important to establish policies around the use of EHR data, including access to raw data files, consolidation of raw limited datasets (if multiple providers are submitting data), data cleaning protocol, data transfer and storage methods, data usage, and reporting expectations.

Legal considerations

A memorandum of understanding (MOU) or data use agreement (DUA) may be required or requested by the provider before sharing data (see Appendix D for PPHIC's example and Appendix J for MOU and DUA definitions). Additionally, it is important to keep data sharing laws in mind, including the Minnesota Health Records Act (MHRA),[6] the Minnesota Government

[6] https://www.revisor.mn.gov/statutes/?id=144.291

Data Practices Act (MGDPA),[7] and HIPPA. The sharing of data will be influenced by provider's interpretation of these statutes.

Considerations for data use

- ☐ Create a data sharing and use document to be agreed upon by all partners prior to sharing data.
- ☐ Identify data storage method. For example, data storage, data transfer, who will have access to the data, etc. should be outlined in a data use agreement or documented in some way among all sharing parties prior to data transfer.
- ☐ Consider comparing data received from providers to other sources to check validity. For example, compare disease prevalence rates to other data sources. See NYC Macroscope publications, listed below.
- ☐ Identify storage location and data steward for data
- ☐ Identify a data analyst, either within local public health department, provider, or a contracted position.

Considerations for both information and data use

- ☐ Identify whether data (e.g., individual patient line-level data) or information (e.g., aggregate reports) will fit your needs.
- ☐ Decide whether a MOU or DUA is necessary.
- ☐ Assess analytic capabilities. Certain skills will be needed to correctly analyze and interpret the EHR data, including:
    - o Spreadsheet (e.g., Excel)
    - o Statistical expertise (rates, weighting, interpretation, etc.)
    - o Statistical language (e.g., R, SPSS, SAS)
    - o Querying language (e.g., SQL)
- ☐ Consider working with partners to assist in data analysis, including local colleges or universities.
- ☐ Offer to provide data quality feedback to providers. For example, missing information on race/ethnicity, or inconsistent recording of measures.

Resources

- Public Health Informatics Institute webpage of resources, including sample data sharing agreements: https://www.phii.org/informatics-savvy-health-department-resources
- Article, 'Developing an Informatics-Savvy Health Department: From Discrete Projects to a Coordinating Program. Part I: Assessment and Governance'

[7] https://www.revisor.mn.gov/statutes/?id=13
http://www.health.state.mn.us/divs/opi/gov/chsadmin/data/mgdpa.html#a

http://phii.org/sites/www.phii.org/files/resource/pdfs/Developing_an_Informatics_Savvy_Health_Department_.14.pdf
- Minnesota privacy and security resources: http://www.health.state.mn.us/e-health/privacy/index.html
- Report to the Minnesota Legislature (2017) re: Impacts and Costs of the MHRA: https://www.leg.state.mn.us/docs/2017/mandated/170396.pdf
- MDH health equity data analysis resources: http://www.health.state.mn.us/divs/chs/healthequity/guide/index.htm

4. Analyze, summarize, and distribute information

Indicator selection

Selection of data indicators will depend on availability and quality of the measures from providers and interest to stakeholders. For example, diet is unlikely uniformly captured in an EHR and should not be included, while tobacco may be more reliable. See table 1 for additional indicator possibilities. Communities may want to consider including additional variables that are relevant to local public health issues (e.g., asthma diagnosis). See Appendix A for PPHIC's draft population and measures definitions. Additionally, CCH developed an indicator framework to pilot in the Twin Cities metro region (see Appendix B).

Table 1. Indicator Domains and EHR Examples

Domain or Type of Indicator	Example
Disease incidence	Influenza, chlamydia, breast cancer, stroke, myocardial infarction
Disease or risk factor prevalence	Hypertension, diabetes, obesity
Disease control	Cholesterol management in coronary artery disease, blood pressure control among those diagnosed
Receipt of recommended services	Pneumococcal vaccine, colonoscopy
Care-seeking behavior	Primary care use by demographics and risk factors
Behavioral health	Tobacco use, depression

Source: Developing an Electronic Health Record-Based Population Health Surveillance System, 2013, https://www1.nyc.gov/assets/doh/downloads/pdf/data/nyc-macro-report.pdf

Inclusion and exclusion criteria

Certain inclusion criteria should be set to appropriately define the population, including demographic group (e.g., patients 18 years and older), time period (e.g., records in 2016),

provider type (e.g., family medicine), eligible providers (e.g., MD), and visit types (e.g., ambulatory visit). See Appendix A for PPHIC's example.

Data quality assessment

Data should be assessed for quality, at least informally. Stearns County compared their data to the regional survey for validation. Additionally, they discounted any measure that had considerable missing or non-standardized data.

There are few studies about EHR data validation techniques. Equivalence testing has been found to be useful for assessing similarity between EHR-based prevalence estimates and survey-based prevalence estimates (Tatem et al., 2017), but requires significant technical expertise. See NYC Macroscope Resources for more information, and be aware that this body of research is expected to evolve in the near future.

Considerations

- ☐ Select population health indicators in tandem with partners and other stakeholders.
- ☐ Define the inclusion and exclusion criteria for your patient population of interest. See Appendix A for PPHIC's example.
- ☐ Create a data dictionary with partners. See Appendix E for PPHIC's example.
- ☐ Examine data and information to understand how much data are missing or non-standardized.
- ☐ Return to partners and community with findings.
- ☐ Provide data quality feedback to partners providing data.

Resources

- The Minnesota Department of Health Center for Health Statistics is a resource available to local public health departments: http://www.health.state.mn.us/divs/chs/ or healthstats@state.mn.us
- The New York City Macroscope is a population health surveillance system that uses EHRs to track conditions managed by primary care practices that are important to public health. See their website and publications for more information, including validation of EHR population health metrics:
    - NYC Macroscope webpage: https://www1.nyc.gov/site/doh/data/health-tools/nycmacroscope.page
    - Developing an Electronic Health Record-Based Population Health Surveillance System Report: https://www1.nyc.gov/assets/doh/downloads/pdf/data/nyc-macro-report.pdf
    - Public Health Services and Systems Research page: http://www.publichealthsystems.org/implementation-and-diffusion-new-york-city-macroscope-electronic-health-record-surveillance-system

  - NYC Macroscope's webinar re: EHR data validation techniques: https://www.youtube.com/watch?v=mzYRHrYNYJ4&feature=youtu.be
  - NYC Macroscope visited Hennepin County to present information about the project. Recordings of this visit can be found here:
    - https://www.youtube.com/watch?v=FI2_0Us6b6A&feature=youtu.be
    - https://www.youtube.com/watch?v=PP9ogCRuFz0&feature=youtu.be
    - https://www.youtube.com/watch?v=q9E0ysJcdx0&feature=youtu.be
- See the following article for information about using population health indicators from an EHR to inform community health assessments: http://uknowledge.uky.edu/cgi/viewcontent.cgi?article=1217&context=frontiersinphssr
- Consider signing up for the All In: Data for Community Health Blog, a nationwide learning collaborative encouraging multi-sector data collaboration: http://www.allindata.org/

Summary and call to action

As demonstrated in this document and shared stories, local public health and health care providers have an opportunity to collaborate to leverage EHR data in order to move data to knowledge, and knowledge to practice to improve community health. This document serves as a practical guide to encourage and support this work by telling stories from pioneering collaborations around Minnesota.

Because this is an emerging area, we encourage all collaborations using EHR data and information to share their stories widely (e.g., at conferences and with MDH), participate in collaborative groups and create communities of interest, and call others to act to improve the health of our communities.

This type of work is relatively new, so ideas and documents shared in this toolkit are subject to change. The Minnesota Department of Health welcomes your thoughts on how to update this practical guide to keep it useful and practical for Minnesota collaborations. If you have questions or comments about this document, please contact mn.ehealth@state.mn.us.

Appendix A. PPHIC draft population and measure definitions

Criteria and measures are subject to change.

Submission frequency: Annually (Jan 1 to Dec 31)

File: Individual patient level; one row per patient (not per encounter)

Patient Population: Established patients who meet each of the following criteria are included in the adult population. Communities may want to include additional variables that are relevant to local public health issues (e.g., asthma diagnosis). These variables were included because they were measured consistently across health systems, and were chronic diseases and risk factors of interest to stakeholders.

PPHIC Measurement period and patient populations		
Measurement period	Baseline dates of service 01/01/2016 to 12/31/2016. Subsequent submissions will be based on calendar year measurement periods.	
Adult **Patient Population** **(CY 2016)**	Established patients who meet each of the following criteria are included in the population: • Patient was age 18 or older at the start of the measurement period (date of birth was on or before 01/01/1998). • Patient was seen by an eligible provider face-to-face at least one time during the dates of service (01/01/2016 to 12/31/2016). Eligible Provider Types: Family Medicine (includes General Practice), Internal Medicine, Geriatric Medicine, Pediatrics, Obstetrics and Gynecology. Eligible providers: Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Nurse Practitioner (NP) Obstetrician, Gynecologist, Pediatrician, Advanced Practice Nurse, Midwife Visit Types- Ambulatory visits, Primary Care Visits, Well-Women Visits, Well-Child *Excluded: Pregnant Women (Pregnancy indicated at any time during reporting period)* *Exclude visits where only a blood draw was done, phone visits or online visits. Visits must be face to face. Exclude inpatient visits.*	

	Exclude Inpatient population	
Pediatric Patient Population **(CY 2016)**	Established patients who meet each of the following criteria are included in the population: • Patient was 2 years of age through 17 years of age at the start of the measurement period (date of birth was on/or after 01/01/1999 and on/or before 01/01/2014). • Patient was seen by an eligible provider in an eligible provider type face-to-face at least one time during the dates of service (01/01/2016 to 12/31/2016) Eligible Provider Types: Family Medicine (includes General Practice), Internal Medicine, Pediatric Medicine, Obstetrics and Gynecology. Eligible providers: Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Nurse Practitioner (NP), Pediatrician, Obstetrician/Gynecologist (OB/GYN), Midwife *Excluded: Pregnant Women (Pregnancy indicated at any time during reporting period)* *Exclude visits where only a blood draw was done, phone visits or online visits. Visits must be face to face.* *Exclude Inpatient population*	
	PPHIC Health Measure Definitions	
Measure #1 **Tobacco Use**	*Numerator:* Patients with current smoking indicated in the EHR structured field in the reporting period (01/01/16-12/31/2016) *Denominator:* Patients who were seen in the reporting period (01/01/16-12/31/2016)	
Measure #2 **Obesity**	*Numerator:* Patients with a Body Mass Index (BMI) ≥ 30, based on most recent documented height and weight in the designated EHR structured field within the reporting period (01/01/16-12/31/2016) *Denominator:* Patients with documented height and weight within the reporting period (01/01/16-12/31/2016)	
Measure #3 **Overweight**	*Numerator:* Patients with a Body Mass Index (BMI) ≥ 25-29, based on most recent documented height	

	and weight in the designated EHR structured field within the reporting period (01/01/16-12/31/2016) *Denominator:* Patients with documented height and weight within the reporting period (01/01/16-12/31/2016)	
Measure #4 **Diabetes (Adults only)**	*Numerator*: Diabetes ICD 10 (or ICD 9) code in the problem list or assessment section of the EHR during OR prior to the reporting period *Denominator*: Patients 18 years and older with at least one visit in the reporting period (01/01/2016-12/31/2016)	Exclude gestational diabetes
Measure #5 **Pre-Diabetes (adults only)**	*Numerator*: Pre-diabetes ICD 10 code (Or ICD 9) in the problem list or assessment section of the EHR during OR prior to the reporting period *Denominator*: Patients 18 years and older with at least one visit in the reporting period (01/01/2016-12/31/2016)	
Measure #6 **Asthma**	*Numerator:* Asthma ICD 10 (or ICD 9) code in the problem list or assessment section of the medical record during OR prior to the reporting period (01/01/2016-12/31/2016) *Denominator*: Patients age 5 years-50 years with at least one visit in the reporting period (01/01/2016-12/31/2016) Excluded: Patients < 5 years (DOB after 01/01/2011) OR ≥ 51 years (DOB prior to 01/01/1966)	The following exclusions must be applied to the eligible population: Patient had a diagnosis of: o Cystic fibrosis, o COPD, o Emphysema or o Acute respiratory failure
Measure #7 **Hypertension (adults only)**	*Numerator:* Patients ages 18 and older with a hypertension ICD 10 (or ICD 9) code in the problem list or assessment section of the EHR during or prior to the reporting period (01/01/2016-12/31/2016) *Denominator:* Patients 18 years and older with a visit in the reporting period of 01/01/2016-12/31/2016	
Measure #9 **Last Blood Pressure (adults only)**	*Numerator:* Last blood pressure measurement during the reporting period of 01/01/2016-12/31/2016 for patients 18 years and older *Denominator:* Patients 18 years and older with a visit in the reporting period of 01/01/2016-12/31/2016	

Demographic Variable Definitions		
Demographic Variable #1 **Age**	Patient's age as of the first day of the reporting period, 01/01/2016.	
Demographic Variable #2 **Sex**	Patient's sex listed in the medical record. Defined as male, female, or unknown	
Demographic Variable #3 **Race**	Patient's reported race as listed in the medical record. Racial categories will be based on the Minnesota Community Measurement REL guidance. Up to 5 Race categories will be pulled per patient.	
Demographic Variable #4 **Ethnicity**	Patient's reported ethnicity as listed in the medical record. Ethnicity categories will be based on the Minnesota Community Measurement REL guidance.	
Demographic Variable #5 **Country of Birth/Origin**	Patient's reported Country of Birth/Origin as listed in the medical record. Country of Birth/Origin will be based on the Minnesota Community Measurement REL guidance.	
Demographic Variable #6 **Preferred Language**	Patient's reported preferred language as listed in the medical record. Preferred language will be based on the Minnesota Community Measurement REL guidance.	
Demographic Variable #7 **City**	Last recorded city of patient's residence address	
Demographic Variable #8 **Zip**	Last recorded zip code of patient's residence address.	
Demographic Variable #9 **County**	Last recorded county of patient's residence address (see list of County Codes)	

Appendix B. Draft CCH Core Indicator Set

Background and Purpose
This document is a product of the Center for Community Health's Assessment Alignment Workgroup (CCH-AA) in the Minneapolis-St. Paul metro region. The CCH Steering Committee charged the CCH-AA Workgroup with developing processes and/or tools that will help cross-sectoral partners in the metro region complete Community Health Needs Assessment (CHNA/CHA) requirements more effectively and with improved collective impact to population health. The CCH-AA Workgroup is publishing this draft data indicator framework toward fulfilment of that charge.

Goals
The indicator framework was developed to achieve the following goals:

1. Provide CCH member organizations with a tool that guides the use of common population health indicators and definitions.
2. Improve consistency among CCH member organizations in using population health data to build consensus on health improvement priorities and targets.
3. Reduce duplicate CHNA/CHA planning work across the metro region.

Guiding Principles
The CCH-AA workgroup used the following guiding principles in developing the framework:

- This is a pilot project. The framework is intended to be used/tested and continuously improved in order to achieve the above goals.
- Include indicators that are: 1) most commonly used across member organization assessments, 2) reflect current priority health topics, and 3) use a mix of data sources (primary, secondary, electronic health records).
- Use existing data sources and definitions with available state and national benchmarks to the extent possible.

	Indicator	Definition	Source
	Adults who are a healthy weight - Metro SHAPE	Percentage of adults whose self-reported Body Mass Index (BMI) is less than 25	Metro SHAPE
	Adults who are a healthy weight - Clinic EHR	Percentage of adults whose measured Body Mass Index (BMI) is less than 25	Clinic EHR
Healthy Eating	Youth who eat the recommended number of fruits and vegetables daily	Percent of 9th grade students who report consuming at least 5 fruits, fruit juices, or vegetables the previous day	Minnesota Student Survey
	Youth who meet physical activity guidelines	Percent of 9th grade students who report exercising or participating in sports which made them sweat or breathe hard for at least 20 minutes at least 3 of the last 7 days	Minnesota Student Survey

	Indicator	Definition	Source
	Adults who meet physical activity guidelines	Percent of adults age 18 and older reporting 30 minutes/day of moderate activity 5 or more times per week or 20 minutes/day of vigorous activity 3 or more times per week	Metro SHAPE
	Adolescents who smoke cigarettes	Percent of adolescents who smoked one or more cigarettes, past 30 days	Minnesota Student Survey
	Young adults who smoke	Percent of adults age 18-24 who report that they smoked in the last 30 days	Metro SHAPE
	Adults who are current cigarette smokers	Percent of adults 18 years or older who: 1) have smoked at least 100 cigarettes in their lifetime (C14); or 2) Now smoke cigarettes every day or some days (C15)	Metro SHAPE
	Adult tobacco status and quit plan	Current tobacco use and presence/type of quit plan	Clinic EHR
	Blood Pressure	Percentage of adults 18-75: "Ever been told by doctor/nurse/health professional you have hypertension, also called high blood pressure"	Metro SHAPE
	Blood Pressure	Percentage of adults 18-75 whose blood pressure is higher than 130/80 mm Hg	Clinic EHR
	Cholesterol	Percentage of adults 18-75: "Ever been told by doctor/nurse/health professional you have high blood cholesterol"	Metro SHAPE
	Cholesterol	Percentage of adults 18-75 with LDL < 100mg/dl	Clinic EHR
	Optimal CV Care	Percentage of adults 18-75: includes A1C <8, LDL <100, BP <140/90, Tobacco-free	Clinic EHR
	Ambulatory diabetic age 65+	Adults age 65 and older who are ambulatory and diabetic	ACS
	Optimal Diabetic Care	Percentage of adults 18-75: includes A1C <8, LDL <100, BP <140/90, Tobacco-free	Clinic EHR
	Adult binge drinking, past 30 days	Percent of males ages 18 and older having five or more drinks on one occasion and females ages 18 and older having four or more drinks on one occasion	Metro SHAPE
	Adolescents using alcohol or any illicit drugs, past 30 days	Percent of adolescents who drank any alcohol or used any illicit substances during the past 30 days	Minnesota Student Survey
	Infant deaths	Rate of infant deaths	Vital Records
	Low birth weight	Percent of singleton births weighing <2500g (5.5 lbs)	Vital Records
	Preterm births	Percent of babies born before 37 weeks of pregnancy	Vital Records
	Suicide rate	Suicide rates: adult, adolescent	Vital Records
	Adolescent Mental Health	Percent of adolescents with composite MH measure above designated threshold (MSS syntax)	Minnesota Student Survey
	Behavioral Health related ED visits	Rate of ED visits and hospitalization related to mental illness (ICD10 codes)	Minnesota Hospital Association
	Adult Depression	Percent of adults 18-75: PHQ9 Depression Screening composite score > xx	Clinic EHR

	Indicator	Definition	Source
Asthma	Children with asthma - Emergency Room visits	Percent of children ages 5-17 who visited the Emergency Room for asthma	Minnesota Hospital Association
	Children with asthma - Hospitalizations	Percent of children ages 5-17 who were hospitalized for asthma	Minnesota Hospital Association
	Cancer incidence by age and type	All cancer combined, incidence rate per 100,000	MN Data Access Portal
	Adults 50 and older who have had colorectal cancer screening	Percent of adults age 50 and older who have been screened for colorectal cancer	Clinical Quality Metric
	Fall deaths among adults 65+	Adults age 65 and older who die as a result of a fall-related injury (ICD10 codes W00 to W19)	Vital Records
	Falls risk assessment	??	EHR?
	Fatal Injuries	Rate of unintentional injury resulting in death - Children (0-17), Adults (18+)	Vital Records
	Homicides	Homicide rate	Vital Records or Criminal Database?
	Dental visit in the last 12 months	Percentage of adults age 18 and older who report visiting a dentist or dental clinic within the past year for any reason (B19 "Within the past year")	Metro SHAPE
	Emergency dental visits	ED Visits for oral pain	??
	Difficulty to pay	Percentage of adults who report it has been "somewhat difficult" or "very difficult" to pay for health insurance premiums, co-pays, and deductibles during the past year (B3)	Metro SHAPE
	Delay of care - medical	Percentage of adults who delayed or did not get care due to cost or lack of insurance (B5, B6)	Metro SHAPE
	Delay of care - mental health	Percentage of adults who delayed or did not get care due to cost or lack of insurance (B8, B9)	Metro SHAPE
	Delay of care - prescriptions	Percentage of adults who delayed or did not get care due to cost or lack of insurance (B13)	Metro SHAPE
Clinical Preventative Services	Immunization Rates	Percentage of Children aged 19 to 35 months who have received vaccines… [Select indicator]: diphtheria, tetanus, and pertussis (DTaP); polio; measles, mumps, and rubella (MMR); Haemophilus influenza type B (Hib); hepatitis B; varicella; and pneumococcal conjugate (PCV)	MIIC?
	Age of housing	Percentage of housing built before 1978	Local GIS?
	Smoke-free housing	Percentage of subsidized housing units that are smoke free	HRA?
Reproductive	Chlamydia rate among females age 15-24*	Rate of chlamydia infection among females aged 15-24 years	MN Data Access Portal
	High school graduation rate	Percent of high school students who graduate with a regular diploma 4 years after starting 9th grade	Minnesota Department of Education

	Indicator	Definition	Source
	3rd Grade Students ready to learn	Percent of students entering 3rd grade ready to learn	Minnesota Department of Education
Arthritis	Adults with arthritis (prevalence)*	Percent of adults age 18 and older with arthritis	Metro SHAPE

Appendix C. PPHIC example data variables by system grid

This type of grid can be used to identify which variables can likely be compared across systems and which variables may pose challenges due to differences in data entry and definition.

Variable	*Provider 1*	*Provider 2*	*Provider 3*
Age	Calculated from DOB Over 89, coded as 90 and older (purpose is de-identification)	Calculated from DOB	Calculated from DOB
Sex	Text box, recorded as male, female, other, unknown	Text box	Male, female, unknown
Race	Race 1, Race 2, etc.	Race 1, Race 2, etc.	Race 1, Race 2, etc.
Ethnicity	Separate from race	65 options, Latino listed as one of the ethnic categories	Ethnicity not separate from race; Hispanic/Latino is listed in race category with an additional ethnicity field with 150+ options
Country of Birth/Origin	Numerous countries listed and can be chosen	Numerous countries listed and can be chosen	Numerous countries listed and can be chosen
Preferred language	Numerous languages listed can be chosen from list	Unknown	Text box
County	Text, but available list of county codes	Text	Text drawn from list of county codes
Tobacco Use	Text, options include multiple categories that can be grouped to reflect current tobacco use: Yes, Never, Passive, Quit, Not Asked	Current Every Day Smoker; Current Some Day Smoker; Smoker, Current Status Unknown; Former Smoker; Never Smoker; Never Assessed; Passive Smoke Exposure - Never Smoked; Unknown If Ever Smoked; Heavy Tobacco Smoker; Light Tobacco Smoker	1-Yes 2-Never 3-Not Asked 4-Quit 5-Passive
Secondhand smoke exposure	Collected in tobacco use field	Unknown	Only asked if person identifies as non-smoker in Tobacco Use field
Height	Updated each year, stored in feet and inches	Updated each visit, text	Updated each visit, text
Weight	Available in ounces, pounds, kilograms, grams	Updated at each visit	Free text, updated if seen

Appendix D. PPHIC data use agreement example

DATA USE AGREEMENT

This Data Use Agreement ("Agreement") is made and entered into effective this __th day of _____, 2016, by and between _____ provider and _____ Public Health Department.

1. This Agreement sets forth the terms and conditions pursuant to which [provider] will disclose certain protected health information, hereafter "PHI" in the form of a Limited Data Set to the Recipient.

2. Terms used, but not otherwise defined, in this Agreement shall have the meaning given the terms in the HIPAA Regulations at 45 CFR Part 160-164.

3. [provider] shall prepare and furnish to Recipient a Limited Data Set in accordance with the HIPAA Regulations or [provider] shall retain Recipient as a Business Associate (pursuant to an appropriate Business Associate Agreement) and direct recipient, as its Business Associate, to prepare such Limited Data Set. NOTICE: This agreement is valid only if the data do not include any of the following prohibited identifiers: names; postal address information other than town, cities, states and zip codes; telephone and fax numbers; email addresses, URLs and IP addresses; social security numbers; Medical record numbers; Health plan beneficiary numbers; Account numbers; certificate and license numbers; vehicle identification numbers; device identifiers and serial numbers; biometric identifiers (such as voice and fingerprints); and full face photographs or comparable images.

4. In preparing the Limited Data Set, [provider] or its Business Associate shall include the data fields specified by the parties from time to time, which are the minimum necessary to accomplish the purposes set forth in this Agreement.

5. Permitted Uses and Disclosures

Except as otherwise specified herein, Recipient may use or disclose the Limited Data Set received from [provider] only in connection with and as necessary to conduct the quality improvement project described herein:

[The goal of the project is to ____. Data can inform all involved organizations about health disparities present in our communities by analyzing the data by various subgroups and sub-geographies. This project will provide the opportunity for participating organizations to respond to data needs of the community such as identifying specific populations in need, or providing insight into whether or not current community health initiatives are having a positive impact on improving health and health outcomes. Ultimately, this work seeks to benefit the residents of ___ by informing all health providers about the health of county residents on a timely basis in order to inform organizational and community health initiatives.

Looking to EHR systems that already collect various measures for Meaningful Use metrics on their patients along with data on health status presents an opportunity to produce timely estimates of various health status indicators for various populations in the county. Combining EHR data with, public health data, and indicators of social, economic, and physical influence will help providers (health and community) identify high risk areas and sub-populations facing greater health risk to focus programming and provide more complete care to residents of _____. The intention of this effort is to develop a

prospective community health data resource that is based on existing public health and health provider EHR data systems that is openly shared between partner organizations and the community]

5.1 ("____ Project"), provided that such use or disclosure would not violate the Privacy Rule if done by [provider].

5.2 In addition to the Recipient, the individuals, or classes or individuals, who are permitted to use or receive the Limited Data Set for purposes of the Project include: [

5.3 [Names: This team includes the ____ project manager as individuals who will be assisting with data processing and analyses. Insert names or classes of persons who may use or receive the limited data set, e.g. the staff, any collaborators, other sites involved in the project, sponsors if applicable, outside laboratories. Note that when the specific individual may change over the course of the project, it is preferable to list their class as opposed to specific names. For example, reference the "project coordinator" as opposed to the name of the current individual performing that role.]

6. Recipient Responsibilities

6.1 Recipient will not use or disclose the Limited Data Set for any purpose other than permitted by this Agreement pertaining to the Project or as required by law;

6.2 Recipient shall not disclose the Limited Data Set to any non-employee agent or subcontractor, unless the non-employee agent or subcontractor has agreed in writing to be bound by the same restrictions and conditions that apply to Recipient with respect to the Limited Data Set prior to the disclosure.

6.3 Recipient will use appropriate administrative, physical and technical safeguards to prevent use or disclosure of the Limited Data Set other than as provided for by this Agreement;

6.4 Recipient will report to the [provider] any use or disclosure of the Limited Data Set not provided for by this Agreement of which the Recipient becomes aware within 15 days of becoming aware of such use or disclosure;

6.5 Recipient will not identify the information contained in the Limited Data Set; and

6.6 Recipient will not contact the individuals who are the subject of the PHI contained in the Limited Data Set.

7. Term and Termination

7.1 The terms of this Agreement shall be effective as of [insert effective date], and shall remain in effect until the Agreement is terminated by the Parties or in accordance with the provisions of this section 7.

7.2 [provider] may terminate this Agreement:

7.2.1 At any time by providing thirty (30) days prior written notice to Recipient.

7.2.2 Immediately if [provider] determines that Recipient has breached or violated a material term of this Agreement; or

7.2.3 Pursuant to Section 8.3 of this Agreement.

7.3 If any breach or violation is not cured, and if termination of this Agreement is not feasible, [provider] shall report Recipient's breach or violation to the Secretary of the United States Department of Health and Human Services, and Recipient agrees that it shall not have or make any claim(s), whether at law, in equity, or under this Agreement, against [provider] with respect to such report(s).

7.4 Upon termination of this Agreement for any reason, including, but not limited to Recipient's decision to cease use of the Limited Data Set, Recipient agrees to return or destroy all Limited Data Set data, including copies and derivative versions. Recipient shall extend the protections of this Agreement to any Limited Data Set information that it does not destroy or return to [provider] and limit further uses and disclosures of such Limited Data Set for so long as Data Recipient and its agents retain Limited Data Set information.

7.5 Sections 5, 6, 7.4, and 8 of this Agreement shall survive any termination of this Agreement.

8. General Provisions

8.1 Recipient shall indemnify, hold harmless and defend [provider] from and against any and all claims, losses, liabilities, costs and other expenses resulting from, or relating to, the acts or omissions of Recipient in connection with the representations, duties and obligations of Recipient under this Agreement. The parties' respective rights and obligations under this Section 4.f. shall survive termination of the Agreement.

8.2 This Agreement shall be governed by and construed in accordance with applicable federal and Minnesota laws.

8.3 [provider] and Recipient agree that amendment of this Agreement may be required to ensure that [provider] and Recipient comply with changes in state and federal laws and regulations relating to the privacy, security, and confidentiality of PHI or the Limited Data Set. [provider] may terminate this Agreement upon thirty (30) days written notice in the event that Recipient does not promptly enter into an amendment that [provider], in its sole discretion, deems sufficient to ensure that [provider] will be able to comply with such laws and regulations.

8.4 Recipient and [provider] understand and agree that individuals who are the subject of Protected Health Information are not intended to be third party beneficiaries of this Agreement.

8.5 This Agreement shall not be assigned by Recipient without the prior written consent of the [provider].

8.6 To the extent that any provisions of this Agreement conflict with the provisions of any other agreement or understanding between the parties with respect to use of the Limited Data Set provided hereunder, this Agreement shall control.

IN WITNESS WHEREOF, the parties hereto execute this Agreement as follows:

RECIPIENT [PROVIDER] HEALTH

By:_____ _____

[name/credential/title]

Date signed: _____ Date signed: _____

Appendix E. PPHIC example data dictionary

Variable Name	Variable Label	Definition	Formatting	Code	
AGE	Age as of 01/01/2016	Age in years	1-2 digits	Report actual age in years- whole number	
GENDER	Gender of patient	Gender of patient listed in medical record	1 digit	1=Male 2=Female 3=Unknown	If Blank, Leave Blank, do not assign code
RACE1	Race	Race of patient in the medical record	1-2 digits	1 = American Indian or Alaska Native 2 = Asian 3 = Black or African American 4 = Hispanic or Latino 5 = Native Hawaiian/Other Pacific Islander 6 = White 7 = Some Other Race / Patient does not identify with any of the race categories provided. 97 = Patient chose not to disclose/declined 98 = Patient reports that his/her race/ethnicity is unknown	Direct from MN Community Measures REL Guidance

Variable Name	Variable Label	Definition	Formatting	Code	
RACE2	Race	Second race of patient listed in the medical record	1-2 digits	1 = American Indian or Alaska Native 2 = Asian 3 = Black or African American 4 = Hispanic or Latino 5 = Native Hawaiian/Other Pacific Islander 6 = White 7 = Some Other Race / Patient does not identify with any of the race categories provided. 97 = Patient chose not to disclose/declined 98 = Patient reports that his/her race/ethnicity is unknown	Direct from MN Community Measures REL Guidance
RACE3	Race	Third race of patient listed in the medical record	1-2 digits	1 = American Indian or Alaska Native 2 = Asian 3 = Black or African American 4 = Hispanic or Latino 5 = Native Hawaiian/Other Pacific Islander 6 = White 7 = Some Other Race / Patient does not identify with any of the race categories provided. 97 = Patient chose not to disclose/declined 98 = Patient reports that his/her race/ethnicity is unknown	Direct from MN Community Measures REL Guidance
RACE4	Race	Fourth race of patient listed in the medical record	1-2 digits	1 - American Indian or Alaska Native, 2 - Asian, 3 - Black or African American, 4 - Native Hawaiian or Other Pacific Islander, 5 - White, 0 - Unknown	Direct from MN Community Measures

Variable Name	Variable Label	Definition	Formatting	Code	
					REL Guidance
RACE5	Race	Fifth race of patient listed in the medical record	1-2 digits	1 = American Indian or Alaska Native 2 = Asian 3 = Black or African American 4 = Hispanic or Latino 5 = Native Hawaiian/Other Pacific Islander 6 = White 7 = Some Other Race / Patient does not identify with any of the race categories provided. 97 = Patient chose not to disclose/declined 98 = Patient reports that his/her race/ethnicity is unknown	Direct from MN Community Measures REL Guidance
ETHNCITY	Ethnicity	Hispanic or Latino. A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.	1 digit	1 - Hispanic or Latino, 0 - Not Hispanic or Latino	

Variable Name	Variable Label	Definition	Formatting	Code	
COUNTRY	Country of Origin	Enter the code that corresponds to the patient-reported country of origin (birth country).	Up to 3 digits	See Table 1 on Country Worksheet	Direct from MN Community Measures REL Guidance
COUNTRY_OTHER	Country of Origin description if other	If Country of Origin is not listed in Table 1, please write in country that is listed	String		
PREF_LANGUAGE	Preferred Language	Enter the code from Table 2 that corresponds to the patient-reported language of preference as indicated in registration	String	See Table 2 on Language Worksheet	Direct from MN Community Measures REL Guidance
LANG_OTHER	Preferred language description if other	If language preference is not listed in Table 2, please write in language that is listed	String		
CITY	City of Residence	Most recently updated City of Residence for patient	String		

Variable Name	Variable Label	Definition	Formatting	Code
ZIP	Zip of Residence	Most recently updated Zip code of Residence for patient	String	
COUNTY	County of Residence	Most recently updated County of Residence for patient	String	
TOBACCO	Current tobacco status	Current tobacco status of patient	1-2 digits	
HEIGHT	Height of patient	Most recently recorded height of patient in Inches	string	Record in Inches
WEIGHT	Weight of patient	most recently recorded weight of patient in pounds	string	Record in Pounds
DIABETES	Patient has ever had diagnosis of diabetes	Diagnosis Codes for Diabetes: See Diabetes Codes listed in Table 3	1 digit	1=yes, 2=no
PRE_DIABETES	Patient has ever had a diagnosis of pre-diabetes	Diagnosis Codes for Pre-Diabetes: See Pre-Diabetes Codes listed in Table 3	1 digit	1=yes, 2=no

Variable Name	Variable Label	Definition	Formatting	Code
ASTHMA	Patient has ever had a diagnosis of asthma	Diagnosis Codes for Asthma: See Asthma Codes listed in Table 3	1 digit	1=yes, 2=no
HYPERTENSION	Patient has ever had a diagnosis of hypertension	Diagnosis Codes for Hypertension: See Hypertension Codes listed in Table 3	1 digit	1=yes, 2=no
LAST_BP	Most recent Blood pressure recording	Most recent Blood Pressure recording in current reporting period	String?	Record in mm/Hg

Appendix F. Minnesota collaborations

COLLABORATIVE	LOCAL PUBLIC HEALTH	HEALTH CARE	OTHERS	PURPOSE	CONTACTS
PRIVATE/ PUBLIC HEALTH INFORMATICS COLLABORATIVE (PPHIC)	Bloomington Public Health Department, Hennepin County Public Health Department (PPHIC Internal project manager), Minneapolis Health Department	Allina Health System, Children's of Minnesota, Fairview Health System, Hennepin County Medical Center, North Memorial-Maple Grove Hospital	NA	Develop a fully-integrated Community Health Needs Assessment (CHNA) model that provides a fuller picture of the health of our communities on a more frequent and timely basis than current assessment strategies provide. Combining EHR data with public health data, and indicators of social, economic, and physical influence will help providers (health and community) identify high risk areas and sub-populations facing greater health risk to focus programming and provide more complete care to residents of Hennepin County.	Emily Thompson, Hennepin County Public Health Department, Emily.Thompson@hennepin.us
CENTER FOR COMMUNITY HEALTH (CCH)	Anoka County Community Health & Environmental Services, Carver County Public Health & Environment, Dakota County Public Health, Hennepin County Public Health Washington County Public Health & Environment, St. Paul-Ramsey County Public Health, Scott County Public Health, City of Minneapolis Health Department, City of Bloomington Division of Health	Allina Health (12 hospitals), Children's Hospitals and Clinics, Fairview Health Services (5 hospitals), HealthEast Care System (4 hospitals), HealthPartners Hospitals (2 hospitals), Hennepin County Medical Center, North Memorial Hospital, Park Nicollet Methodist Hospital, Ridgeview Medical Center, MN Hospital Association	Health Plans: Blue Cross Blue Shield/Blue Plus of MN, HealthPartners, Medica, Metropolitan Health Plan, PreferredOne, UCare, MN Council of Health Plans	VISION: Using data and assessment tools health plans, hospitals and governmental public health agencies will achieve the Triple Aim of better health, increased quality and reduced cost. MISSION: To improve the health of our community by engaging across sectors and serving as a catalyst to align the community health assessment process and the development of action plans to impact priority issues and increase organizational effectiveness.	Washington County Public Health & Environment, PHE@co.washington.mn.us

COLLABORATIVE	LOCAL PUBLIC HEALTH	HEALTH CARE	OTHERS	PURPOSE	CONTACTS
COMMUNITY HEALTH ALLIANCE (CHA)	Isanti County Public Health, Chisago County Health and Human Services, Kanabec County Health and Human Services, Pine County Health and Human Services, Mille Lacs County Community Health, Mille Lacs Band of Ojibwe Public Health Department	Allina Health, Essentia Health, Fairview Health Services, FirstLight Health System Ex Officio Members: Minnesota Department of Health, elected officials, subject matter experts, health advocates	Health Plans: Blue Cross/Blue Shield, HealthPartners, Medica, South Country Health Alliance, Ucare	To improve community health a multi-county alliance of healthcare, health plans, and local public health join together. Strengthening coordination by increasing effective sharing and use of community health data for performance management, and by promoting efficient use of limited resources. Alliance members are appointment from the East Central Minnesota area that have responsibility and accountability for community health.	Tony Buttacavoli, Director, Isanti County Public Health, tony.buttacavoli@co.isanti.mn.us
BRIDGING HEALTH DULUTH	St. Louis County Public Health & Human Services	St. Luke's Hospital, Essentia Health,	Generations Health Care Initiatives, Zeitgeist Center for Arts and Community	Members of this group and other healthcare leaders conducted the 2015 Bridge to Health survey in late 2015, with results released at a regional conference in April 2016. With the survey results in hand, Bridging Health Duluth followed up with focus groups to further understand what the community feels are the greatest health needs. Bridging Health Duluth is currently working to develop an implementation plan, which outlines goals, priority audiences, strategies and potential partners for addressing each of the four areas of greatest need (mental health; alcohol, drugs and tobacco use; obesity; and socio-economic disparities based on race and neighborhood)	Amy Westbrook, Public Health Division Director, St. Louis County Public Health & Human Services, WestbrookA@StLouisCountyMN.gov

COLLABORATIVE	LOCAL PUBLIC HEALTH	HEALTH CARE	OTHERS	PURPOSE	CONTACTS
CENTRAL MINNESOTA - STEARNS COUNTY AND CENTRACARE	Stearns County Public Health Division	CentraCare Health	NA	Upon the start of their first CHIP, Stearns County reached out to hospitals in the county to learn more about their work, data needs, and how they could work together. Following these meetings, the group established there was interest in collaborating around a regional, multi-county behavioral risk factor survey. Ultimately, five counties and five hospitals agreed to jointly fund and administer the survey. The results of the first multi-county survey indicated an unusually high rate of smoking among women in the county, so the local health department consulted with a specific provider, CentraCare, to investigate this anomaly using EHR data.	Renee Frauendienst, Stearns County Public Health Division Director, Renee.Frauendienst@co.stearns.mn.us

Appendix G. Project definition tool

Name of Project	
Date	
Sponsor(s)	
Project Manager	
Business Context/Background: Can be used to describe the problem or current state in a paragraph. In this space provide a description of the history or background leading to the need for this effort.	
Intentions: The purposes or reasons that the effort is undertaken; the results that are expected from the effort. "Defined as the expected end results of the project, intentions are ideally expressed in business terms and the reasons the enterprise is expending resources. For example, a company may want to define intentions as increase sales, improve customer service, or reduce operating costs."	
Expected End Result of the Effort-How Will The World Be Different? "The anticipated final impacts or benefits the effort is expected to have." In this space you will create a bulleted list of ways in which the world will be a better place as a result of you doing this work - deliverables. This is a bulleted list of the outcomes you intend to achieve.	
Effort Contribution-What Will the Project Do to Achieve the End Results? The portion of the Expected End Result that falls within the province and responsibility of the project. The remaining effort would, by implication, be the responsibility of someone other than the project team. The two efforts together would be expected to yield the expected end results. This is a bulleted list of activities you will embark on to achieve the outcomes – verb/noun sentences.	
Values: Values are the set of beliefs, trade-offs and judgment-guidelines that govern the project results and how they are obtained. For example, speed of delivery may be more important than slick design. Or, it might be worth it to extend a project if team members receive valuable training along the way. System quality may be so important that a company will spend more time and other resources on a project to get it right the first time and avoid costly repair or retrofit later. Whatever values exist, all interested parties must understand and agree to abide by the same set in order for the project to succeed. At the root of most conflicts are the differences in values or unarticulated values.	
Values	
Stakeholders: Anyone who might be impacted by or who can impact the success of the project.	
Direct Stakeholders: Someone directly impacting or impacted by this effort	
Indirect Stakeholders: Someone impacting or impacted by the effort by virtue of his/her connection to a direct stakeholder	
Focus: Focus is the domain of the effort/solution: what is in scope and out of scope; what people, systems and initiatives the solution must integrate with. Basically, what portion of the business can be examined and ultimately included in the development of the solution. Focus is the primary tool for controlling "runaway" expansions of the effort.	
Breadth (In Scope): The portion of the business processes, activities, functions and/or organizational units covered by the effort."	

Breadth (Out of Scope): The portion of business processes, activities, functions, and/or organization units **NOT** covered by the effort.	
Context: …other parameters that should be commonly established, agreed upon and monitored during the project. Elements of context include issues, uncertainties, understandings (e.g., mutually agreed-upon assumptions) and latitudes (e.g., leeway granted to, or limitations placed upon a project). All involved parties need to be aware of these so as to avoid unpleasant surprises. This is all pretty important stuff – anything that shows up as a constraint, barrier, risk, must have an activity associated with it in your plan. In other words, you have to have an action to address each of them.	
General Context Statements:	
Constraints: Limitations on the solution and the conducting of the effort.	
Risks: Unfavorable potential occurrences or circumstances, i.e., things that could go wrong, for which the project must have a mitigating strategy.	

Project definition tool developed by Hennepin County Human Services and Public Health Department Project Management

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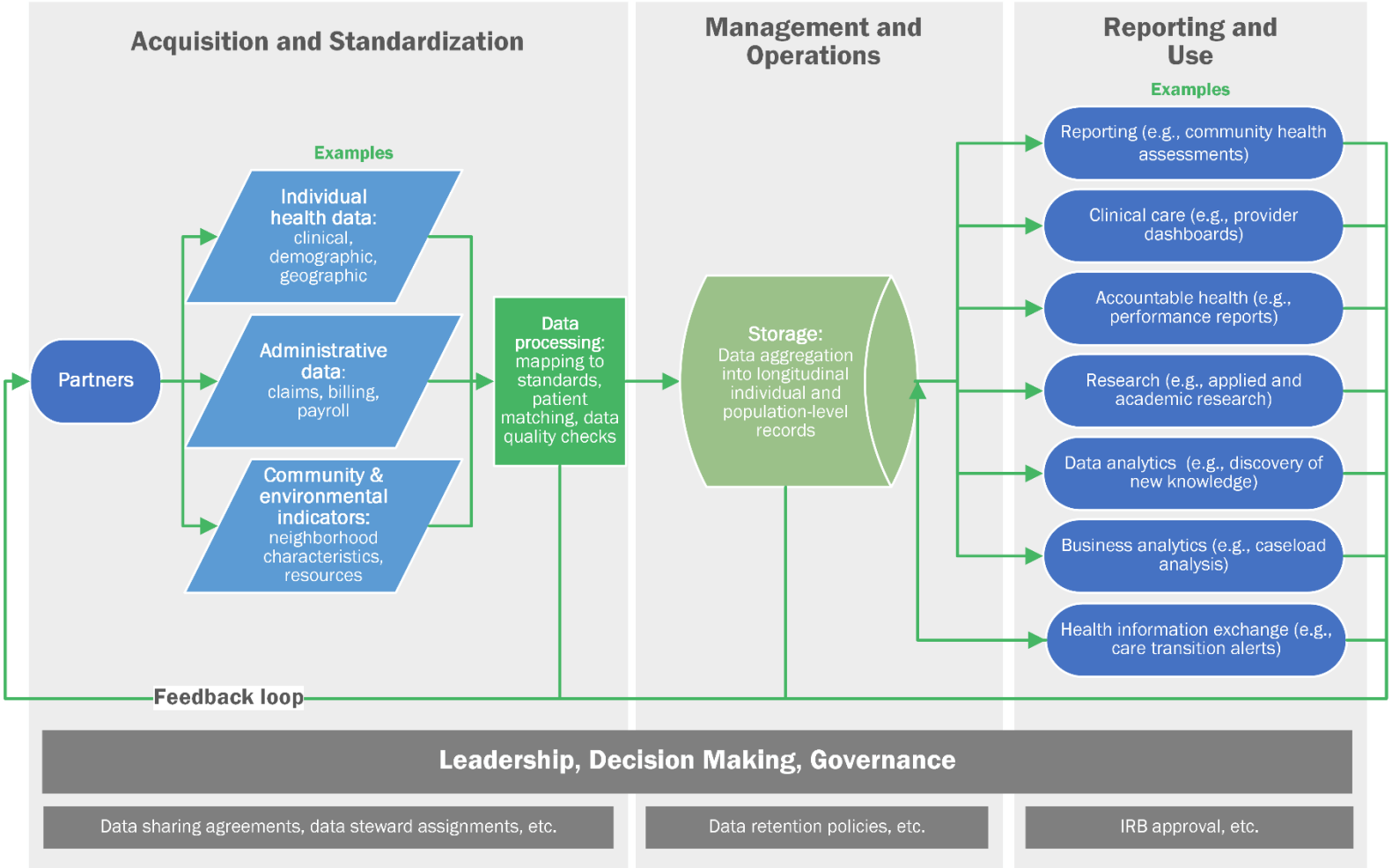
Appendix I. Minnesota e-Health Data Repository Framework

Figure 1. Proposed Framework for e-Health Data Repository Services to Support Population Health in Minnesota
Components and processes for a health organization to consider



DEPARTMENT OF HEALTH

Developed by the Minnesota Department of Health Office of Health IT 4/27/17

Introduction

This framework was created following a literature review and key informant interviews. The goal of the interviews was to understand informatics characteristics of current and emerging e-health data repositories among health systems in Minnesota and their opportunities and readiness to support public health practice. Interviews were conducted with a variety of settings and addressed e-health data repository characteristics, data content, data management, and governance.

Preliminary findings from key informant interviews provide a profile of data elements and structure, indications of data quality, and geographic distribution to support public health surveillance of chronic and infectious disease. There are various models for optimizing the use of data based on the EHR system used in each setting, internal resources and capacity for managing data, and needs for managing patient and client information. Common challenges noted in interviews are to accommodate varying definitions of "repository", as well as to bridge the health information technology (HIT) language and terminology across types of providers and their varying level of understanding of HIT concepts.

The purpose of the framework is to understand and summarize key services and functions for the collection of data to support individual and population health in an e-health data repository. There is significant potential, as documented in the literature and as demonstrated in key informant interviews, for e-health data repositories to be used as a population and public health resource to support the health of a community.

An e-health data repository includes a database and a set of functions that consolidate data from clinical and other data sources and present a unified view of a single person. Repositories are also sometimes referred to as registries, databases, or data warehouses. (Adapted definition from Minnesota Statute 62J.498, Subdivision 1, paragraph (a)). In some cases, electronic health record (EHR) systems may provide some or all of these functions including data acquisition and standardization, a database where data are housed and managed, and core e-health data repository capabilities and components. This is usually more common in organizations without resources needed to maintain and utilize all components of a warehouse, repository, or database. Therefore, this framework is applicable to a database and a set of functions combined to support individual and population health.

This framework is intended to represent capabilities and services that can exist in to a broad range of health settings including large health systems, local public health, non-hospital provider groups, research institutions, and critical access hospitals. The e-health data repository framework is organized into three components – data acquisition and standardization, management and operations, and reporting and use. Overarching across all three components are leadership, decision making, and governance best practices and policies. Feedback loops support continuous improvement in data quality and in health and care to support a Learning Health System (LHS).

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Appendix J. Selected glossary of terms

Aggregate data: Data that have been transformed into summary accounts. The process of aggregation removes individually identifying information, which is a major advantage for data exchange. However, aggregate data cannot be analyzed using multivariable modeling techniques. Excerpted from: https://www1.nyc.gov/assets/doh/downloads/pdf/data/nyc-macro-report.pdf

- **Business Associate Agreement (BAA)**: A contract between a covered entity and its business associate or a business associate and its subcontractor that must contain the elements specified at 45 CFR 164.504(e). For example, the contract must: Describe the permitted and required uses of protected health information by the business associate; Provide that the business associate will not use or further disclose the protected health information other than as permitted or required by the contract or as required by law; and Require the business associate to use appropriate safeguards to prevent a use or disclosure of the protected health information other than as provided for by the contract. Excerpted from: Office of the National Coordinator for Connecting Health and Care for the Nation: A Shared Nationwide Interoperability Roadmap Draft Version 1.0 Appendix G: HIT Glossary (http://www.healthit.gov/policy-researchers-implementers/interoperability

- **Community Health Assessment (CHA):** A community health assessment identifies and describes factors that affect the health of a community, and the factors that determine available resources to address those factors. A community health board, or another lead organization, collects, analyzes, and begins to use data to prioritize issues and make decisions. Excerpted from: http://www.health.state.mn.us/divs/opi/pm/lphap/community/cha.html

- **Community Health Improvement Plan (CHIP)**: a long-term, systematic effort to address public health problems in a community. It is based on the results of community health assessment activities, and is one step in a process to improve community health. The community health improvement plan is developed collaboratively, and defines a vision for the community's health; the community health improvement plan is the community's plan, not the community health board's plan for the community. Excerpted from: http://www.health.state.mn.us/divs/opi/pm/lphap/community/chip.html

Community Health Needs Assessment (CHNA): a federal requirement for private, non-profit hospitals. Part of the Patient Protection and Affordable Care Act (ACA), the Community Health Needs Assessment is additional criteria for hospitals to maintain their tax-exempt, 501(c)(3) status. A hospital must complete a CHNA at least every three years with input from the broader community, including public health experts. Excerpted from: http://www.mnhospitals.org/data-reporting/mandatory-reporting/community-health-needs-assessment

Data Use Agreement (DUA): A data use agreement entered into by both the covered entity and the researcher, pursuant to which the covered entity may disclose a limited data set to the researcher for research, public health, or health care operations. See 45 CFR 164.514(e). The data use agreement must:

- Establish the permitted uses and disclosures of the limited data set by the recipient, consistent with the purposes of the research, and which may not include any use or disclosure that would violate the Rule if done by the covered entity;
- Limit who can use or receive the data; and
- Require the recipient to agree to the following:
    - Not to use or disclose the information other than as permitted by the data use agreement or as otherwise required by law;
    - Use appropriate safeguards to prevent the use or disclosure of the information other than as provided for in the data use agreement;
    - Report to the covered entity any use or disclosure of the information not provided for by the data use agreement of which the recipient becomes aware;
    - Ensure that any agents, including a subcontractor, to whom the recipient provides the limited data set agrees to the same restrictions and conditions that apply to the recipient with respect to the limited data set; and
    - Not to identify the information or contact the individual.

Excerpt from: https://www.hhs.gov/hipaa/for-professionals/special-topics/research/index.html?language=es

Electronic Health Record (EHR): EHR is a real-time patient health record with access to evidence-based decision support tools that can be used to aid clinicians in decision-making. The EHR can automate and streamline a clinician's workflow, ensuring that all clinical information is communicated. It can also prevent delays in response that result in gaps in care. The EHR can also support the collection of data for uses other than clinical care, such as billing, quality management, outcome reporting, and public health disease surveillance and reporting. EHR is considered more comprehensive than the concept of an Electronic Medical Record (EMR). Source: Office of the National Coordinator for HIT Health IT Glossary (http://www.hhs.gov/healthit/glossary.html)

Health Insurance Portability and Accountability Act of 1996 (HIPAA): HIPAA is a federal law intended to improve the portability of health insurance and simplify health care administration. HIPAA sets standards for electronic transmission of claims-related information and for ensuring the security and privacy of all individually identifiable health information. **References:** The CMS website for HIPAA is http://www.cms.hhs.gov/HIPAAGenInfo. The Office for Civil Rights (the Enforcer of HIPAA Privacy) website under HIPAA is http://www.dhhs.gov/ocr/hipaa.

Inclusion criteria: set of predefined characteristics used to identify subjects who will be included in a research study. Inclusion criteria, along with exclusion criteria, make up the selection or eligibility criteria used to rule in or out the target population for a research study. http://methods.sagepub.com/reference/encyc-of-research-design/n183.xml

Informatics: Public health informatics is the effective use of information and information technology to improve public health practice and outcomes. http://phii.org/phii-voices/PH-Info-Defined

Limited data set (LDS): A LDS is protected health information that excludes direct identifiers of the individual or of relatives, employers, or household members of the individual. A covered entity may disclose a LDS for public health purposes, including those that are emergency preparedness activities. The covered entity must have a data use agreement in order to disclose the LDS. https://www.hhs.gov/hipaa/for-professionals/special-topics/emergency-preparedness/limited-data-set/index.html

Minnesota Health Records Act (MHRA): Minnesota law governing health records information, Minnesota Statutes 144.291 through 144.298. https://www.revisor.mn.gov/statutes/?id=144.291

- **Population health**: an approach to health that aims to improve the health of an entire population. One major step in achieving this aim is to reduce health inequities among population groups. Population health seeks to step beyond the individual-level focus of mainstream medicine and public health by addressing a broad range of factors that impact health on a population level, such as environment, social structure, resource distribution, etc. An important theme in population health is importance of social determinants of health and the relatively minor impact that medicine and healthcare have on improving health overall. http://www.health.state.mn.us/e-health/glossary/p.html

Social Determinants of Health: Complex, integrated, and overlapping social structures and economic systems that are responsible for most health inequities. These social structures and economic systems include the social environment, physical environment, health services, and structural and societal factors. Social determinants of health are shaped by the distribution of money, power, and resources throughout local communities, nations, and the world. Retrieved from: Commission on Social Determinants of Health (CSDH), Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health. 2008, World Health Organization: Geneva.

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Other

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