

Literature Review on Web application to store and analyze data on the impact of social determinants of health

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1 Project Paper / Report

1.1 Abstract

This paper focuses on the declining health due to a gap in information and knowledge about our lifestyle and surroundings. To address this issue a website is proposed as a solution. The proposed system would assist locals and professionals in managing health-related data efficiently. However, data privacy and the accuracy of information is still into concern. Addressing these issues has the potential to significantly improve health outcomes and overall quality of life in the community.

1.2 Introduction

In the realm of healthcare, the intricate interplay between health outcomes and social determinants has become increasingly evident. The primary focus of the application is to efficiently store and analyze data. Bangladesh, a country marked by its unique socio-economic landscape, faces distinct challenges in understanding and mitigating the impact of diseases influenced by social determinants. The application aims to simplify information collection by utilizing database management system principles, allowing healthcare professionals, researchers, and policymakers to gain meaningful insights into the correlations between health outcomes and social determinants.

1.3 Literature Review

Researchers in this field frequently use a multidisciplinary approach, combining quantitative and qualitative methods. The research framework involves the systematic collection of various datasets about social determinants of health such as socioeconomic status,

education, and environmental factors. Web applications serve as the foundation, utilizing advanced analytics and machine learning algorithms to extract meaningful insights from the collected data. A critical gap analysis, on the other hand, reveals the need for more comprehensive and standardized approaches to integrating various datasets. Interoperability issues and inconsistent data collection methods persist across existing applications, implying the need for a unified framework to improve the accuracy and reliability of analyses.

1.4 Problem Statement

Health is a major issue in our society. Without any proper guidance and help, our quality of life is decreasing. There is a huge gap in information in our society. Our goal is to create a website to help local people and professionals handle data more efficiently. Data on factors that affect the quality of life and health are collected. The collected data are analyzed. Users' data is collected. Gender, childhood trauma, housing stability, neighborhood, hospital facility quality, and other characteristics have a direct or indirect impact on our quality of life. Data is collected and evaluated, and graphs are created.

1.5 Methodology

The study uses a method, that includes surveys on a specific area-based population, to analyze the impact of social determinants of health. The purpose of the study is to examine healthcare access and quality, education access and quality, social and community context, economic stability, neighborhood and built environment using rigorous research and the literature review papers. The findings provide valuable insights into how social factors influence health, wealth, education, living conditions, and social status, suggesting implications for targeted interventions and recommendations.

ERD: This Entity-Relationship Diagram (ERD) illustrates a complex data model with entities such as Individuals, HealthRecords, EconomicFactors, Education, HealthcareInfrastructure, EnvironmentalConditions, Nutrition, and Interventions. Entities are connected through primary and foreign keys, representing relationships between them. The entities have some degrees and cardinality between them including some relational attributes, associative entity and subtypes. For instance, the relation between HealthRecord and Individual is Mandatory One to Many. The diagram incorporates various attributes, including economy, education, healthcare infrastructure details, and environmental conditions, providing a comprehensive representation of the interconnected data entities within the system.

Relational Schema: Each entity from the original ERD is translated into a corresponding table in the relational schema. For instance, "Individuals," "HealthRecords," "EconomicFactors," and others become distinct tables to organize and store related data. Primary keys, denoted by "underline" uniquely identify each record within a table. For example, "Individual" has an ID as its primary key. Foreign keys, indicated by "Dashed-underline" establish relationships between tables by referencing the primary keys of other tables. For instance, the "IndividualID" in the "HealthRecords" table connects to the primary key in the "Individuals" table, creating a relationship between health records and individuals. The connection is shown by an arrow referencing the primary key. Basically efficient data retrieval, storage, and maintenance in a relational database system is accomplished by a relational Schema

Normalization: Normalization is used for minimizing data redundancy and ensuring data integrity. The relational schema is first organized into 1st Normal Form (1NF) by ensuring atomic values for all attributes. Subsequently, the schema is refined to 2nd Normal Form (2NF) by ensuring that attributes are functionally dependent on the primary key. 3rd Normal Form (3NF) is achieved by eliminating transitive dependencies. Finally, Boyce-Codd Normal Form (BCNF) is maintained, ensuring that every functional dependency has a determinant. This step-wise normalization process results in a well-structured and efficient relational database, minimizing redundancy and ensuring data integrity.

Software Architecture: PHPMyAdmin is a powerful tool for managing and analyzing health-related data in a relational database system. It allows users to create tables, such as the "HealthRecords" table, using SQL statements. The tables are defined based on the Entity-Relationship Diagram (ERD), and the normalization process ensures data integrity and minimizes redundancy. After installing XAMPP and starting the Apache and MySQL services, we accessed PHPMyAdmin through a web browser. Here, we created a new database, naming it, for instance, 'health_service'. Subsequently, within PHPMyAdmin's SQL tab, execu

Once tables are created, we insert sample data to facilitate testing. The normalization process, which ensures data integrity and minimizes redundancy, has already been applied to the schema. Relationships between tables, established through foreign keys, mirror the interconnected structure of the ERD. Notably, in the "HealthRecords" table, the "IndividualID" serves as a foreign key referencing the "ID" in the "Individuals" table, illustrating the relationships between health records and individuals.

Moving forward, we executed SQL queries within PHPMyAdmin for data retrieval and analysis. For instance, a query might fetch health records along with individual details. Integration with PHP allowed us dynamic interaction with the database in a web application. PHP scripts can execute SQL queries and display data on the web interface. It's essential to secure database connections and employ prepared statements to prevent SQL injection.

In summary, this comprehensive approach using XAMPP and PHPMyAdmin encompassed our database creation, table definition, normalization, relationship establishment, and dynamic data interaction through PHP, providing a robust foundation for managing and analyzing health-related data in a relational database system.

1.6 Result Analysis

In terms of the environment, the website has given users the ability to make informed decisions about their living environments, influencing lifestyle choices that benefit both personal and environmental well-being. By providing a platform for users to contribute to the collective understanding of health determinants, the website can play a critical role in fostering social awareness and community engagement. The data analysis tools that were used successfully processed and evaluated the collected data, resulting in insightful graphs.

1.7 Problem Analysis

The data collected is personal information that raises privacy concerns. Users might not want to share accurate information, which will affect the data analysis. A few pieces

of information are very to collect for example hospital supply information or enrolled students data. Such a lack of data collection can generate less reliable results.

1.8 Conclusion

Conclusion: In conclusion, web applications for SDOH data storage and analysis have revolutionized our approach to health disparities. These tools enhance data accessibility, empower robust analysis, and generate actionable insights for evidence-based decisions. They excel in data management, visualization, and geospatial integration, with advanced analytics and real-time data integration holding immense promise. Policy-wise, these platforms enable targeted interventions, program evaluation, and advocacy through compelling data visualization. However, challenges remain in data privacy, sustainability, user-friendliness, and intersectoral collaboration. Addressing these challenges will unlock the full potential of these tools, allowing us to leverage data for effective interventions, social justice, and a healthier, more equitable future.

2 Paper 1: Social determinants of malaria prevalence among children under five years: A cross-sectional analysis of Akure, Nigeria.

Journal/Conference Rank: Q1

Publication Year: 2022

Reference: [1]

2.1 Summary

The study studies growing incidence of pediatric malaria in Akure, Nigeria, with a focus on SDH (social determinants of health). The closeness of garbage sites, availability of healthcare, and preventative measures like insecticide-treated nets and window screens have all been recognized as significant contributors. Children who use nets, have covered windows, and live more than 10 meters from a trash dump are less likely to get malaria. In order to reduce malaria, interventions must take into account these elements, not only for immediate health benefits but also for long-term sustainable development objectives. With the help of this research, future public health measures will be guided by the complicated interaction between socioeconomic variables and malaria.

2.2 Software Architecture

R (version 3.6.3) was used in the research for bivariate and multivariate analysis. Relationships between factors and childhood malaria were found using bivariate techniques like Chi-square and Fisher's exact test. The odds ratios (OR) and adjusted odds ratios (aOR) for malaria probability taking into account different parameters were reported using logistic regression models that were chosen by backward elimination using Schwartz's Bayesian information criteria.

2.3 Data Parameters

The research used logistic regression analysis to provide reliable findings as it examined U5 malaria in 568 homes (0.6 percent of the population) from 1000 buildings in Akure, Nigeria. It took into account demographic, socioeconomic, and health characteristics.

2.4 Datasets Used

The study in Lagos, Nigeria, examines a range of factors, including statistics, parental status, schooling, financial status, ITN usage, health infrastructure, cleanliness, and street conditions, in order to estimate the incidence of malaria among kids younger than the age of five (U5). Based on this information, targeted health initiatives are taken.

2.4.1 Paper Link

Access the full paper at <https://www.sciencedirect.com/science/article/pii/S2468227622001041>.

3 Paper 2: Effect of Social Determinants of Health on Uncontrolled Human Immunodeficiency Virus (HIV) Infection Among Persons with HIV in San Francisco, California

Journal/Conference Rank: Q1

Publication Year: 2022

Reference: [2]

3.1 Summary

The San Fernando Department of Health and Welfare (SFDPH) conducted programs between the years 2010 and 2014 with the goal of promptly admitting HIV patients into treatment and giving them antiretroviral medicine (ART) after a diagnosis. As a consequence of these initiatives, there were considerably fewer patients having untreated HIV infections. In order to determine how SDH affected uncontrolled HIV, patients in the city of San Francisco who got diagnosed with Aids and received ART between the years 2017 and 2019, were investigated. A variety of SDH characteristics, including educational attainment, poverty, insurance, revenue, and income disparity, were linked to a greater likelihood of uncontrolled HIV infection, according to the research, which was based on longitudinal data from 7486 individuals. People with socioeconomic problems need additional help to attain their best health outcomes, even with proven care facilities. This study shows how important it is to include socioeconomic factors in treatment of HIV in addition to conventional medical treatments.

3.2 Software Architecture

Cross-sectional data, which make it difficult to draw conclusions about the relationship between (SDH) and HIV infection, are one of the study's weaknesses. Because of the 3-year data frame, which was imposed by the availability of surveillance data, establishing

temporality was difficult. SDH measurements were based on census tracts rather than specific persons, which may have given an inaccurate picture of people’s socioeconomic standing. Generalizability was hampered by classification peculiar to San Francisco, and categorization accuracy was, although somewhat, influenced by inconclusive lab data. Substance abuse and mental health, both of which affect HIV outcomes, were underreported. The study’s utilization of consistent, ongoing, and very thorough HIV monitoring data is one of its main advantages, however. Precision was increased by the examination of several SDH parameters and the particular census tract-level methodology. Despite these drawbacks, the research offers important insights into how HIV results affect socioeconomic inequalities.

3.3 Data Parameters

Between 2017 and 2019, researchers in the Bay Area analyzed 7486 HIV-positive individuals. Of them, 597 had uncontrolled HIV. 90

3.4 Datasets Used

Data collection: Sociodemographic and healthcare information from the HIV surveillance program were utilized. SDH Metrics provide data on income, protection, coverage for insurance, and poverty based on Census 5-Year Data. The results of the most recently viral load test demonstrate uncontrolled HIV. Demographics: We examined factors including race or ethnic background, gender, age, mode of transfer, place of birth, and housing situation. Analysis: To compare the case characteristics, logistic regression was utilized. For each SDH metric, significant variables were seen as assassin adjusted models. conducted a sensitivity study that included HIV-positive homeless people.

3.4.1 Paper Link

Access the full paper at <https://www.semanticscholar.org/paper/Effect-of-Social-Determinants-of-Health-on-Human-in-Melo-Hessol/73a71f246cff37b785cb746137422af6c7b313b> .

4 Paper 3: Integration of Case-Based Dialogue to Enhance Medical Students’ Understanding of Using Health Communication to Address Social Determinants of Health

Journal/Conference Rank: Q2

Publication Year: 2023

Reference: [1]

4.1 Summary

The study draws attention to persistent health disparities that affect underprivileged populations, with a focus on African Americans and people of low socioeconomic statuses. (SDOH), such as access to food, housing, and healthcare, on healthcare inequality

is highlighted. Implicit bias and insufficient knowledge of health care, which are especially common in underprivileged populations, further aggravate these differences. The paper emphasizes the need of adding case-based encounters and small-group debates into the medical curriculum to tackle SDOH and health literacy and assist students better understand population health inequities. The study's objective is to assess how various teaching methods have impacted medical students' knowledge of SDOH and motivation to practice in underserved communities. There are restrictions that might prevent it from being adopted, used, and scaled up in alimentary and agricultural supply chains.

4.2 Software Architecture

This study used a prospective pre-post group strategy to investigate the third-year medicine students' understanding of socioeconomic factors of wellness (SDOH) and their desire to practice in disadvantaged areas. The educational component included an online pedagogic module, a simulated case study with an emphasis on the SDOH, and a discussion in a small group facilitated by the application of communication theories. Students' knowledge of SDOH confidence in resolving these issues in healthcare were evaluated by an online survey. Demographic data was acquired for the study, and a paired t-test was utilized to determine the results. The major objective was to evaluate how the training changed students' perceptions of SDOH and motivation to work in disadvantaged areas.

4.3 Data Parameters

640 third-year family medicine clerkship students took part between July 2020 and April 2022. 70.9 percent of people were white or Caucasian, while 11.1 percent were Hispanic or Latino. Backgrounds from urban and rural areas were divided equally (60.5

4.4 Datasets Used

A variety of datasets from various sources, including academic articles, practitioner-focused research, and company reports, were utilized in the study. It collected data from peer-reviewed, high-impact papers that were available for free via Google Scholar and renowned databases like Scopus, Science Direct, and IEEE Xplore. These provide significant new understandings on healthcare inequalities, social determinants of health, unconscious bias, health literacy, and methods for dealing with these problems. They provide a solid basis for your study since they are drawn from reliable sources including Health Affairs, the CDC, and the American Public Health Association.

4.4.1 Paper Link

Access the full paper at <https://www.dovepress.com/getfile.php?fileID=88170s>.

5 Paper 4: The Impact of Social Determinants of Health on Children with Asthma

Journal/Conference Rank: Q1

Publication Year: 2020

Reference: [1]

5.1 Summary

Asthma is a common chronic illness that affects children, and its results vary depending on a number of variables, including social determinants of health (SDH) including housing, pollution, and access to treatment. Studies show that socioeconomic and environmental variables have a major influence on asthma outcomes, especially in poor groups, despite the lack of defined mechanisms. In order to minimize asthma inequities, this essay underlines the critical necessity to recognize and manage SDH. Conditions affecting health opportunities and hazards are referred to as SDH by the World Health Organization. At least half of asthma cases are impacted by SDH, which may account for up to 50

5.2 Software Architecture

The recommended paradigm for targeting social variables of health (SDH) in asthma patient outcomes classifies barriers into categories including physiologic requirements, security, sense of belonging, self-esteem, and becoming oneself. It is based on the Maslow's hierarchy of requirements. Numerous SDH factors interact with the impact poverty and race affecting asthma outcomes. Healthcare professionals can employ strategies like group decision-making and clear teaching to deal with these problems. For targeted treatments, population health programs for asthma need multidisciplinary methods and cooperation with local partners. Efficiency. These technologies provide continuous surveillance, traceability, and quality control. The use of information transporters, RFIDs, and TTIs that are enhances the supply chain's overall efficiency and food safety. Future trends are expected to be bright for bioactive smart packaging, and data collection has to become better all the time. The use of sophisticated manufacturing technologies allows for decreased production costs and complexity. Consumer acceptance and understanding are crucial for the commercial viability of these cutting-edge packaging solutions.

5.3 Data Parameters

Take use of Maslow's Hierarchy of Needs to address asthma inequities. Use subtle methods to address issues including poverty, racism, physiologic needs, safety, and self-esteem. Sharing decisions and providing clear instruction are two ways that healthcare practitioners may improve comprehension. Finding the underlying causes, involving communities, and screening for socioeconomic factors are necessary for population health solutions. Comprehensive initiatives reduce patient visits while improving results. To lessen inequities, collaborate and exchange data with community partners.

5.4 Datasets Used

The study examines socioeconomic variables such living circumstances, allergen exposure, and healthcare access in asthma outcomes for kids by combining questionnaires, medical records, and environmental data. Important relationships and discrepancies are shown by this method. systems like Google Scholar, Core, Dimensions, PubMed, DOAJ, Web of Science, Science.gov, and OSF Preprints are used by researchers to access academic material. These systems collect a variety of publications and journals, including open-access articles and preprints, enabling thorough data collecting.

5.4.1 Paper Link

Access the full paper at <https://pubmed.ncbi.nlm.nih.gov/32294541/>.

6 Paper 5: Impact of Social Determinants of Health on the Emerging COVID-19 Pandemic in the United States.

Journal/Conference Rank: Q1

Publication Year: 2020

Reference: [1]

6.1 Summary

This research analyzes how social and economic factors on health (SDOH) have changed during the course of the COVID-19 epidemic. It emphasizes how susceptible groups are more likely to have severe sickness as a result of the infection, particularly the elderly and those who have underlying illnesses including diabetes, heart failure, hypertension, or chronic renal disease. Differences in socioeconomic position are often associated with these problems. Governments can ensure that everyone has an equal chance to stay healthy and respond to medical crises more skillfully by looking into SDOH. The study highlights the need to tackle these underlying issues and put strategic plans into place to safeguard the most vulnerable throughout pandemics. The potential to increase productivity and profitability by abiding by fundamental business principles is a matter that needs further investigation. As a result, it is stressed how crucial it is to comprehend how virtualization would affect the supervision of the distribution of groceries system. The article provides a comprehensive examination in this respect, beginning with a summary of fictitious IoT-based food delivery systems and concluding with a suggestion for a systems model that may put these ideas into action. The application of the structure into a practical scenario involving an undersea supply network is covered at the end, giving important information about how these innovative ideas and techniques are put into practice.

6.2 Software Architecture

Social factors that affect the quality of wellness (SDOH) have a significant influence on individual well-being and community health. Access to healthcare, social context, living conditions, and economic stability are all interconnected and have an effect on one another. For instance, education level affects employment, financial stability, and access to healthcare. These variations, which have an impact on infection and mortality rates, were discovered by COVID-19. Poor circumstances and restricted access to high-quality schooling perpetuate health inequities and poverty over generations. In order to create more equitable and healthier communities, SDOH must be addressed.

6.3 Data Parameters

This study emphasizes the importance of important social determinants of health (SDOH) during pandemics, including poverty, race, living circumstances, prejudice, and access to healthcare. In order to overcome these inequities, it emphasizes the significance of education, public awareness, and multidisciplinary cooperation with agencies like NIH, CDC, and WHO. In order to eliminate illnesses globally, the document promotes equitable access to healthcare for all people, regardless of race or financial background.

6.4 Datasets Used

The research adopts a design-focused methodology. The study is conducted in four stages: validation, design and implementation, requirements specification, and literature review. It is unclear where and how certain data or datasets were utilized since the text does not specifically indicate the data parameters and datasets used in the study.

6.4.1 Paper Link

Access the full paper at <https://pubmed.ncbi.nlm.nih.gov/32793544/>.

7 Paper 6: Analysis of the impact of social determinants and primary care morbidity on population health outcomes by combining big data: A research protocol

Journal/Conference Rank: Q1

Publication Year: December 2022

Reference: [3]

7.1 Summary

This study demonstrates the link between SDH and population health as well as the geographical variations resulting from these variables. A variety of technological advances have been created to make it easier to evaluate social determinants of wellness (SDH) and use this information to direct health policy. A method that is gaining more attention is the capacity to create medical result forecasting algorithms which take a variety of socioeconomic aspects with health concerns into account. We want to use primary medical care (PC), which is significantly decreased for SDH as predictors, to estimate results for population health assessed as hospital morbidity. We also wish to explore the geographical variance of the effect of SDH-adjusted the PC incidence on the hospital's morbidity by combining data from digital health records with particular National Statistics Institute methodologies.

7.2 Software Architecture

RAND methodology in accordance with SDH frameworks

7.3 Data Parameters

Here are some of the variables that are used: Variable outcome, Health service EHRs, research era

7.4 Datasets Used

As a result of the unquestionable development in technology for communication and information, the MeSH term "electronic medical record (EHR)" was adopted in 2010, and the total amount of Medline entries has since grown significantly (to 26,236). The main purpose of this form of approach, in accordance with SDH framework and RAND the approach, is to offer information to assist in data selection.

7.4.1 Paper Link

Access the full paper at <http://www.example.com/jse/vol15/issue3/paper1.pdf>.

8 Paper 7: Leveraging Data and Digital Health Technologies to Assess and Impact Social Determinants of Health (SDoH): Literature Review

Journal/Conference Rank: Q1

Publication Year: Dec 2021

Reference: [1]

8.1 Summary

In order to enhance population health, the study investigates analytics- and AI-based approaches that might be used to evaluate non-clinical social determinants of wellness (SDoH). The primary objective of the paper was to conduct a creative literature review to determine how the SDoH data and electronic health records are used to enhance population health management. This article focuses on elements that might have an effect on health, such as social and economic challenges, behavior, medical treatment, and environmental issues. In this article, both the information set and the technique of artificial intelligence are both employed. Geocoding was yet another widely used approach ($n = 23$). Another is AI($n=9$) (MALLET).

8.2 Software Architecture

The paper provides details about the software architecture used in the study. However, it mentions the application of various of data search and AI technology.

8.3 Data Parameters

In the context of data sets and AI technology, the article examines data collecting and use, which is used to the health sector in order to enhance that area. It states that data may include product information. It does not, however, go into detail on the precise data

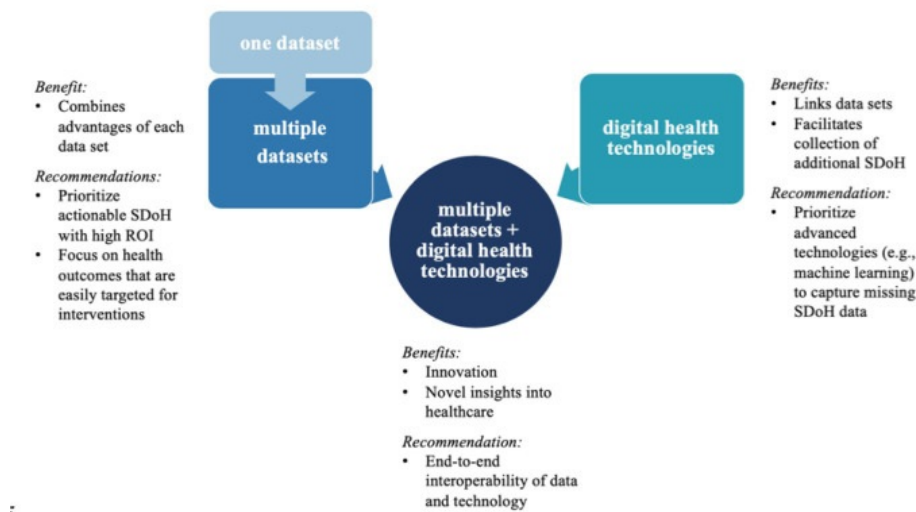


Figure 1: Software architecture diagram for Paper 1.

parameters or metrics used in the research. The possibility of technological literacy is emphasized throughout the study.

8.4 Datasets Used

The paper discusses how to leverage a range of sources of information to enhance SDoH insights. Utilizing cutting-edge techniques, previous information has been mined for fresh SDoH-related insights. Structured (machine-readable data) and structured (text) sources were combined in a number of studies using SDoH data. The US census and electronic health records were the two sources that were utilized the most often, while other sources including federal, provincial, and local patient information (such as data from registration systems along with nationally representative health surveys). It was also noted that non-clinical data, such as that on housing, lawbreaking, and poverty, was taken from public databases. Additionally, social media material from websites including the social networking site and Yelp was a contemporary external source.

8.4.1 Paper Link

Access the full paper at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8765800/>.

9 Paper 8: Social determinants of health in electronic health records and their impact on analysis and risk prediction: A systematic review

Journal/Conference Rank: Q1

Publication Year: November 2020

Reference: [1]

9.1 Summary

This research examined the use of electronic health records and its consequences using analytics and risk forecasting based on literature searches using the CINAHL, PubMed, Cochrane in EMBASE, and PsycINFO databases. In this study, electronic health records, or EHRs, and social factors that influence of health (SDoH) groups are merged. SDoH may have an impact on the diagnosis of diseases, the usage of medical services, the cost and quality of medical care, as well as other detrimental effects. ER visits, surgical procedures, and readmissions are all at increased risk with SDoH. The techniques and sources utilized to gather and sort the SDoH-related domains are also examined in this work. For the information collection in this investigation, the PRISMA (Prefers Reporting Items for Systemic Reviews and Meta-Analyses) requirements were used.

9.2 Software Architecture

Describe the software architecture used in the paper.

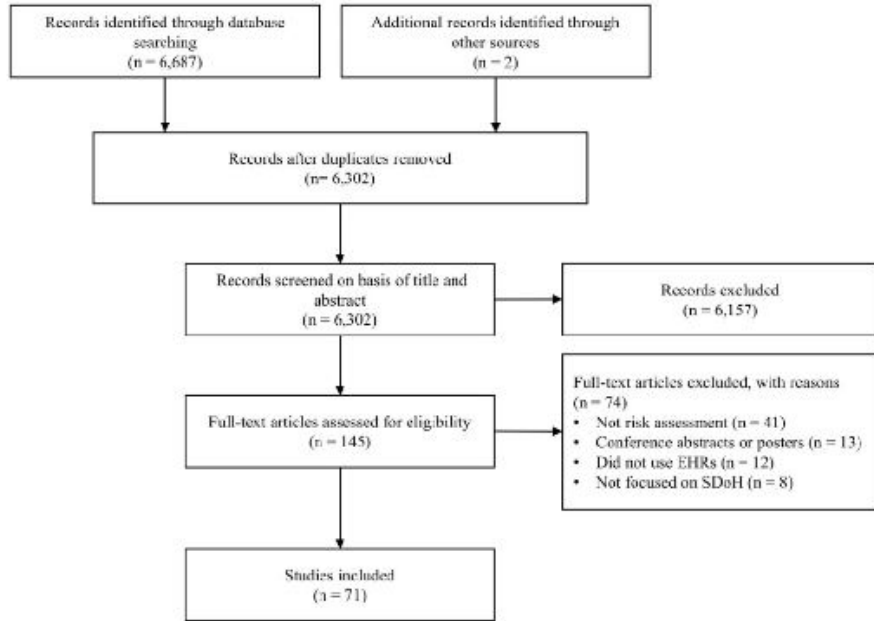


Figure 2: Software architecture diagram for Paper 1.

9.3 Data Parameters

The paper discusses the collection and utilization of data within the context of data set, data library search, publications and AI technologies. Which is used for health sector for electronic health record. It mentions that data can include information about products. However, it does not delve into specific data parameters or metrics used in the study. The paper focused on the potential literacy of electronic health records risk factors.

9.4 Datasets Used

Each selected article had all the specified set of data elements for the investigation. These included the year of release, the nation of birth, the data origin, the participant

population size, the scope of the SDoH measures used, information on the integration of SDoH data into EHRs, measurements of outcome, methods of research, the purpose of the study, findings, and any relevant limitations. Due to the volatility of the research that was included and the lack of standardized or similar reporting of SDoH category and outcome variables, meta-analysis was not practical. We used narrative synthesis to synthesize our info and provide descriptions for SDoH.

9.4.1 Paper Link

Access the full paper at <http://https://www.researchgate.net/publication/347296060>.

10 Paper 9: Social Determinants of Health and Diabetes: A Scientific Review

Journal/Conference Rank: Q1

Publication Year: January 2021

Reference: [4]

10.1 Summary

Multiple studies throughout the course of time have shown that those with low incomes and people who define as racial or ethnic minorities are more likely to develop diabetes in the US. Additionally, these regions have long-term trends of mortality rates that are above average and sequelae from diabetes. Social determinants of health (SDOH) have emerged as critical intervention targets to achieve health equality as the emphasis of healthcare has shifted to outcomes for community health and value-based care. Recent evidence of the differential vulnerability of undeveloped areas, populations of people by color, or racial and ethnic minorities comes from the COVID-19 epidemic. Professional bodies such as the National Academy of Medicine, the Association of Basic Medical Experts, the United States College of Physicians, and the American Board of Pediatrics have all released comments addressing SDOH in the wake of the concurrent pandemic. Key ideas and SDOH frameworks are introduced at the beginning of this article. The research's executive summary focuses on diabetics in the United States and covers all of the following SDOH categories: medical services (access, cost, and quality). National advisory groups provide recommendations for studies that will influence practice, research on glucose, and connections between healthcare organizations and local industries.

10.2 Software Architecture

This essay is primarily concerned with preventing diabetes and the value of doing so over time. How medical institutions changed and quickly took action during COVID-19. Diabetics also need this. The accessibility of a suitable smart route accounts for the differences in amenities.

10.3 Data Parameters

The data variables that were used in the investigation should be described and listed. Amongst them are nonprofit groups (HealthLeads, Aunt Bertha), the Centers for Prevention

and Control of Diseases (CDC), the National Academies of Engineering, Science, and Medicine, the American Medical Association, and the American College of Physicians.

10.4 Data sets Used

The State Department of Health were taken into account in our evaluation because they were an aspect of an adequate corpus of research to demonstrate their impact on diabetes and because they were a component of one or more already present SDOH frameworks. SDOH were included in our evaluation because they were a part of an adequate body of literature to demonstrate their impact on diabetes and because they were a component of a variety of pre-existing SDOH frameworks. At all SES levels, socioeconomic status (SES) reliably predicts the onset and progression of a number of illnesses, including diabetes. Organizations for health-related information also provide accurate data.

10.4.1 Paper Link

Access the full paper at <https://diabetesjournals.org/care/article/44/1/258/33180>.

11 Paper 10: Data Sources for Understanding the Social Determinants of Health: Examples from Two Middle-Income Countries: the 3-D Commission

Journal/Conference Rank: Q1

Publication Year: September 2021

Reference: [1]

11.1 Summary

Years of studies have shown that those with low incomes and people who identify as racial or ethnic minorities are disproportionately afflicted by diabetes in the US. Additionally, these regions exhibit long-term trends of higher than usual rates of mortality and complications from diabetes. Social determinants of health (SDOH) have become essential intervention targets for attaining health equality as the emphasis of health care has shifted toward population health outcomes and value-based care. Recent evidence of the differential vulnerability of impoverished areas and populations of people of color and racial and ethnic minorities comes from the COVID-19 epidemic. The American College of Physicians, American Academy of Pediatrics, Society of General Internal Medicine, National Academy of Medicine, and other professional groups have all released comments addressing SDOH in the aftermath of the concurrent epidemic. At the start of this article, essential ideas and SDOH frameworks are introduced. The review of the literature focuses on American studies of adults with diabetes and covers the five SDOH: socioeconomic status (education, income, occupation); neighborhood and physical environment (housing, built environment, toxic environmental exposures); food environment (food insecurity, food access); and health care (access, affordability, quality). The study's

suggestions for diabetes research, research that will influence practice, and connections between the health care and community sectors are provided by national advisory groups.

Figure 3: Software architecture diagram for Paper 1.

11.2 Data Parameters

Mention in the paper

11.3 Data sets Used

The data for this article came from CGD (citizen-generated data), CSOs (civil society organizations), DHS (demographic and health survey), and KIHBS Basic. Furthermore, there were two new data sources for HEALTHY SDH in two LMICs, Kenya and the Philippines.

11.3.1 Paper Link

Access the full paper at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8409472/>.

12 Paper 11: Supporting Rural Public Health Practice to Address local-level Social Determinants of Health across Northwest States: Development of an Interactive Visualization Dashboard

Journal/Conference Rank: Q1

Publication Year: May 2022

Reference: [1]

12.1 Summary

The study focuses on the impact of the environment on rural residents. The goal of the project is to address the issue of data storage. As a fix, a model is created, then its optical validity is evaluated. In order to draw volunteers from a wide range of geographic areas, including rural and frontier areas of Alaska, as well as parts of Idaho, Oregon, and Washington, they changed traditional UCD methodologies. Volunteers from each of the four countries are sought at every step of the project, which includes requirements analysis, mock-up construction, and usability testing. To create a usable dashboard, they gathered information from only one group of significant health markers. The usefulness of this little quantity of data was assessed in order to discover additional details about how to incorporate data into other significant health areas.

12.2 Software Architecture

For the SHARE-NW alpha test site's data dashboards, this study utilized Tableau. Each of the three dashboard story pages had one to three visuals. Design choices for features and functionality were influenced by the outcomes of the mockup development.

12.3 Data Parameters

They used descriptive statistics to assess usability characteristics. They used the Adjusted Wald Method to calculate the ranges of confidence for task completion success.

12.4 Data sets Used

The use of quantity data is mentioned in the study. The research used quantitative methods using pre-established usability measures to properly assess the system's usability. With the use of these metrics, it was feasible to assess a variety of usability criteria, including effectiveness, efficiency, satisfaction, and learnability, in-depth.

12.4.1 Paper Link

Link : <https://www.sciencedirect.com/sdfe/reader/pii/S1532046422000673/pdf>.

13 Paper 12: Digital inclusion as a social determinant of health

Journal/Conference Rank: Q1

Publication Year: 2021

Reference: [1]

13.1 Summary

The essay focuses on the advantages of adopting digital solutions for data storage while managing medical records. Research shows that using technologies more regularly may enhance patient assistance outside of clinic visits, boost patient engagement, and enhance health outcomes. These tools include patient portals, health trackers, and remote monitoring devices. Internet access and digital literacy are the "super social determinants of health" (SDOH) since they address all other SDOH. For instance, more and more people are applying for employment, housing, and other help opportunities online, all of which have an impact on their health. The Lifeline Program's influence is limited by low consumer awareness and a qualifying procedure that is state- and service-specific. Additionally, Internet access can still be affordable even with the monthly subsidies. It's unknown how these initiatives fared in the wake of the COVID-19 outbreak. They provide suggestions to encourage the fair use of mobile health technology as clinical care increasingly includes technology in more situations.

13.2 Software Architecture

This essay focuses more on digital literacy and its growing significance. How 19 medical institutions changed and became digital during COVID. the variation in amenities brought on by the availability of suitable smart gadgets.

13.3 Data Parameters

The availability of digital literacy is significantly influenced by the economy, community, physical environment, health care system, education, and cuisine. It refers to all other social and environmental aspects of life that affect health.

13.4 Data sets Used

To guarantee equal access to and use of information and communication technologies, a number of measures must be taken, including providing broadband Internet access at an affordable price, providing Internet-enabled devices, making digital literacy training accessible, providing high-quality technical support, and developing online tools and content that promote independence, participation, and collaboration. They serve as the framework for the use of mobile technologies in the healthcare sector.

13.4.1 Paper Link

Access the full paper at <https://www.nature.com/articles/s41746-021-00413-8>.

14 Paper 13:Internet of Things (IoT) enabled health-care helps to take the challenges of COVID-19 Pandemic

Journal/Conference Rank: Q1

Publication Year: 2021

Reference: [1]

14.1 Summary

The subject of the paper in question is IOT. In order to do the necessary task, smart gadgets may collect data and convey it in everyday life. These breakthroughs raise living standards and production in both established and emerging economies and civilizations. In order to reach higher efficiency requirements, it might be difficult to understand the technologies being employed, their advantages, and the main applications that go along with them. The Internet of Things (IoT) has the capacity to provide outcomes of the highest standard employing cutting-edge technologies. It has developed into a new reality in the area of medicine, offering the greatest treatment and conducting precision surgery to COVID-19 patients. Sensors are used to sense, acquire, and receive the essential data on a patient's health and sickness. Everything that is tangible in this situation is networked (linked to the Internet), and gadgets show real-time process monitoring. Specific physicians obtain the appropriate medical information in accordance with their demands.

14.2 Software Architecture

Hardware, software, and medications are all combined with the Internet of Things (IoT) to develop intelligent information systems that are customized to the needs of each COVID-19 patient. Software is a must for the best monitoring and communication methods. To offer the best service possible in the future, all records are held in strict confidence.

14.3 Data Parameters

They can efficiently monitor and regulate all the vital indicators such as temperatures, blood glucose levels, arterial pressure, and details on COVID-19 patient health by employing smart sensors.

14.4 Datasets Used

Various data are gathered utilizing sensors and other medical equipment. By saving the data, it may be utilized to provide patients precise therapy.

14.4.1 Paper Link

Link <https://www.sciencedirect.com/science/article/pii/S2212426821000154>.

15 Paper 14: Quantifying Health Systems' Investment In Social Determinants Of Health, By Sector, 2017–19

Journal/Conference Rank: Q1

Publication Year: 2023

Reference: [1]

15.1 Summary

This essay demonstrates how, over the last 10 years, awareness of the importance of socioeconomic determinants of health for health outcomes has grown. Instead of attempting to identify every kind of social variable that may be targeted by health systems for intervention, they searched more broadly for therapies recognized as being focused at social determinants or community health. Due to the enormous number of efforts that concentrated on it, they divided the realm of economic stability into its own portions. Thus, the six categories of work, food security, housing (housing quality and stability), and education (early childhood education, language, and literacy) were included. They discovered that 57 (9.1

15.2 Software Architecture

Software architecture is not the main topic of this essay. It focuses on investments, healthcare system quality, and how such factors link to socioeconomic determinants of health.

15.3 Data Parameters

Because so many programs focused on it, they divided the realm of economic stability into its constituent sections. They also integrated housing instability and housing quality into one housing category since both focuses were commonly present in the same housing-focused initiatives in practice.

15.4 Datasets Used

Different data sets are used. The data sets are presented as tables. The features of a healthcare system are shown on the table. The number of beds, teaching status, pediatric care status, and other information are shown.

15.4.1 Paper Link

Access the full paper at <https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2019.01246>.

16 Paper 15: Integrating Data On Social Determinants Of Health Into Electronic Health Records

Journal/Conference Rank: Q1

Publication Year: 2018

Reference: [1]

16.1 Summary

This study focuses on how healthcare professionals are discovering that information outside of typical clinical outcomes might provide a broader view on the causes of a person's illness and may propose tactics to improve the effectiveness of treatment. The industry is paying greater attention to population health. It will take some time until data on social determinants of health, such as affluence and environmental conditions, are as accessible and relevant as statistics on health. It highlights the uneven implementation of the criteria for include or depicting socioeconomic determinants of health in electronic health records. They suggest creating national standards over the presentation of information about social variables associated with health in electronic healthcare records, encouraging gathering of data via financial as well as quality indicators, and expanding the body of study that evaluates the impact of acting on the knowledge that is gathered in order to tackle these issues and use social variables in hospitals effectively. For the implementation of effective clinical decision-support procedures to address social and financial factors that affect health, both inside the medical record system and throughout different systems, data consistency is crucial.

16.2 Software Architecture

There is no software architecture in this study. The creation of a standard for socioeconomic determinants of health is its main objective. As a result, the information gathered is more precise and efficient.

16.3 Data Parameters

The few variables that make up a data set include race, ethnicity, usage of cigarettes and alcohol, and health insurance. Research suggests that understanding these socioeconomic determinants of health might enhance prediction models and provide medical practitioners a fuller picture of a patient's particular circumstances.

16.4 Datasets Used

Datasets are utilized and frequently gathered in electronic health records and include safety issues, financial problems, mental health, and other demographic variables.

16.4.1 Paper Link

Link <https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2017.1252>.

17 Paper 16: The Social Determinants of Health: It's Time to Consider the Causes of the Causes

Journal/Conference Rank: Q1

Publication Year: 2014 Jan-Feb

Reference: [1]

17.1 Summary

The article provides instances of the shortcomings of medical treatment, such as Thomas McKeown's studies, which ascribed increasing life expectancy in the 19th century more to improved living circumstances than to medical advancements. More evidence of the complicated link between medical treatment and health outcomes may be seen in the expanding mortality inequalities in the UK after the installation of the National Health Service and the high medical expenditure but poor health rankings in the U.S.

The article's main point is the critical impact that social variables, especially socioeconomic ones, have on people's health and other health indices. It necessitates a deeper comprehension of the fundamental causes of the socioeconomic issues that affect health. This article provides a thorough explanation of social impacts on health with an emphasis on the critical role that social determinants play in determining how people's health will develop. Numerous studies have backed this point of view. Only 10% Over half of all working-age deaths in the nation may be attributable to avoidable causes connected to lower educational level, according to a study by Jemal et al. utilizing U.S. mortality records from 2001. In the United States in 2000, myocardial infarction and lung cancer caused more deaths than variables including low academic attainment, racial segregation, and a lack of social support, according to Galea and colleagues' meta-analysis. The article also highlights the significant links between a person's socioeconomic position or social standing, including their income and degree of education, and a number of health indices. A stepwise gradient pattern often appears in this relationship, with health improving as social position rises. These findings, which hold true across racial/ethnic teams as well as American and European statistics, demonstrate that racial or ethnic traits do not fully account for disparities in health.

The research also argues that racial discrimination and cultural legacies of discrimination may be damaging to health because they serve as ongoing pressures in social interactions, independent of a person's financial status. Due to this, there have been variations in health outcomes, including variations in birth outcomes for highly educated women, which emphasizes the extensive impact of socioeconomic determinants on health. The article concludes by making a compelling argument for the significance of social variables, such as prejudice, education, and poverty, in influencing health outcomes and emphasizing the need of addressing social determinants in order to enhance public health.

17.2 Software Architecture

This paper focuses more on digital literacy ..

17.3 Data Parameters

List and describe the data parameters used in the paper.

17.4 Datasets Used

Educational attainment ,Family income.

17.4.1 Paper Link

Access the full paper at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3863696/>.

18 Paper 17: The association between coffee and caffeine consumption and renal function: insight from individual-level data, Mendelian randomization, and meta-analysis

Journal/Conference Rank: Q1

Publication Year: 14 December 2021

Reference: [1]

18.1 Summary

In order to better understand the connection between caffeine intake, drinking coffee, and renal function, this study focuses on markers of kidney health and ongoing kidney disease (CKD). Individual data analysis and the use of Mendelian randomization (MR), as well as a meta-analysis and a systemic review are two different techniques used in the study. The association between renal function indicators and caffeine usage is investigated using data from the National Psychosocial and Nutritional Examination Surveys (NHANES). GWAS summary-level data on coffee consumption and kidney activity are used in MR. Both of these GWAS included large participant populations ($N = 133,413$ for the renal system and $N = 91,462$ for coffee intake).

The relationship between the use of coffee, intake of caffeine, and kidney function is examined using a variety of MR techniques, including the inverse variable weighted method (IVW), scaled median-based technique, MR-Egger, MR-RAPS, and MR-PRESSO. For the meta-analyses and random effects models, generic inverse variance approaches are used. A leave-one-out strategy is utilized for the level of sensitivity analysis.

In a nutshell, this study combines genes, nuclear medicine (MR), and conventional analysis of data to thoroughly assess the connection among caffeine consumption, renal function, and elucidate the possible impacts of these factors on ongoing kidney failure and symbols of kidney health.

The relationship between coffee consumption, consumption of caffeine, and kidney function is examined using a variety of MR techniques, including the inverse volatility weighted method (IVW), weighted median-based approach, MR-Egger, M-RAPS, and Mri-PRESSO. For the meta-analysis and random variation models, generic inverse variance approaches are used. A leave-one-out strategy is utilized for the threshold analysis.

In a nutshell, this study integrates genetic information, nuclear medicine (MR), and conventional data analysis to completely evaluate the relationship between caffeine consumption, renal function, and elucidate the possible implications of these factors on chronic renal failure and evidence of kidney health.

18.2 Software Architecture

This paper focuses more on digital literacy .

18.3 Data Parameters

Coffee, chronic renal illness, the NHANES, and systematic reviews are some examples of mendelian randomization.

18.4 Datasets Used

This paper focuses more on digital literacy .

18.4.1 Paper Link

Access the full paper at <https://www.semanticscholar.org/reader/8e477e6b4f2a5c204b6fa3e010c9105872>

19 Paper 18: Social determinants of health in electronic health records and their impact on analysis and risk prediction: A systematic review

Journal/Conference Rank: Q1

Publication Year: 07 November 2020

Reference: [1]

19.1 Summary

It is extensively explored how the inclusion of the social elements of health (SDoH) categories in electronic medical records (EHRs) affects risk evaluation and health outcomes. In order to find pertinent English-speaking studies that have been completed up to March 2020, the study employed PRISMA principles to conduct an extensive literature search in multiple databases. The survey found 71 distinct articles that answered the research issues; the majority of those papers, the majority of which were released after 2017, were American. unexpectedly 79Studies using individual-level SDoH data showed enhanced predictive accuracy for a range of healthcare effects, included service referrals, adherence to medicines, and the propensity for a 30-day readmission. However, research using outside area-level the SDoH information found that their influence on prediction model accuracy was negligible.

The study also emphasized the lack of agreement among authors about the SDoH metrics used and the screening instruments already in use in the literature. According to the research, utilizing personal level symptoms of SDoH data in electronic health records may benefit risk assessment, healthcare use planning, and health outcomes. These results emphasize the importance of efforts to collect and regulate patient-level SDoH data inside electronic health records.

19.2 Software Architecture

This paper focuses more on digital literacy .

19.3 Data Parameters

electronic health records, social determinants of health, behavioral factors, systematic review, risk assessment, and social aspects

19.4 Datasets Used

"EHR" stands for "electronic health record," while "SDoH" is an acronym for "social determinants of health."

19.4.1 Paper Link

Access the full paper at <https://academic.oup.com/jamia/article/27/11/1764/5959858>.

20 Paper 19: Addressing Social Determinants to Improve Patient Care and Promote Health Equity: An American College of Physicians Position Paper

Journal/Conference Rank: Q1

Publication Year: 17 April 2018

Reference: [1]

20.1 Summary

The American College of Physicians (ACP) is aware of how social determinants of health (SDoH) affect people's health outcomes. Non-medical variables including income, education, environmental circumstances, employment, and social support systems are included in SDoH since they may have a significant influence on health and contribute to health inequalities.

The need of addressing SDoH within the healthcare system is emphasized in this ACP policy document. It highlights the importance of understanding and resolving these factors since they are mostly to blame for serious health inequalities. The study makes a number of significant policy recommendations, including promoting interprofessional cooperation, advancing research into SDoH, and supporting the use of electronic health records (EHRs) as tools to improve health outcomes.

The ACP emphasizes the need of public policies aimed at reducing socioeconomic inequalities and improving health equality. In order to promote evidence-based healthcare treatments and guide decision-making, it also enables the collection and use of data on SDoH. The goal is to equip interested parties, including physicians and officials, to advocate for legislation that eliminate injustices and enhance health equality for everyone.

This position paper essentially emphasizes the fundamental significance of addressing SDoH in healthcare and offers comprehensive solutions to address this issue, making it a top priority for physicians and the medical community.

20.2 Software Architecture

This paper focuses more on digital literacy .

20.3 Data Parameters

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20.4 Datasets Used

...

20.4.1 Paper Link

Access the full paper at <https://www.acpjournals.org/doi/10.7326/m17-2441>.

21 Paper 20: Taking stock of the social determinants of health: A scoping review

Journal/Conference Rank: Q1

Publication Year: May 11, 2017

Reference: [1]

21.1 Summary

This scoping review examines the vast corpus of research on socioeconomic determinants of health (SDOH) in relation to the contemporary population and public health. The conceptual models, frameworks, and lists used to describe SDOH are becoming more and more complicated, and this might lead to misunderstanding. For the research, 108 publications from academic and grey literature databases that were released between 2004 and 2014 underwent in-depth analysis. The publications' research contexts, target audiences, and geographic emphasis were all quite different; a substantial portion was from Canada and was targeted at decision-makers. Authors used a variety of techniques to convey SDOH, and they commonly included lists, models, or anecdotes in their presentations. A reoccurring theme emerged from the research: "Health equity" is an important and unifying concept used in the SDOH framework. However, there were differences in authors' interpretations of what health equity meant, which had an influence on the strategies adopted to combat SDOH.

21.2 Software Architecture

Describe the software architecture used in the paper.

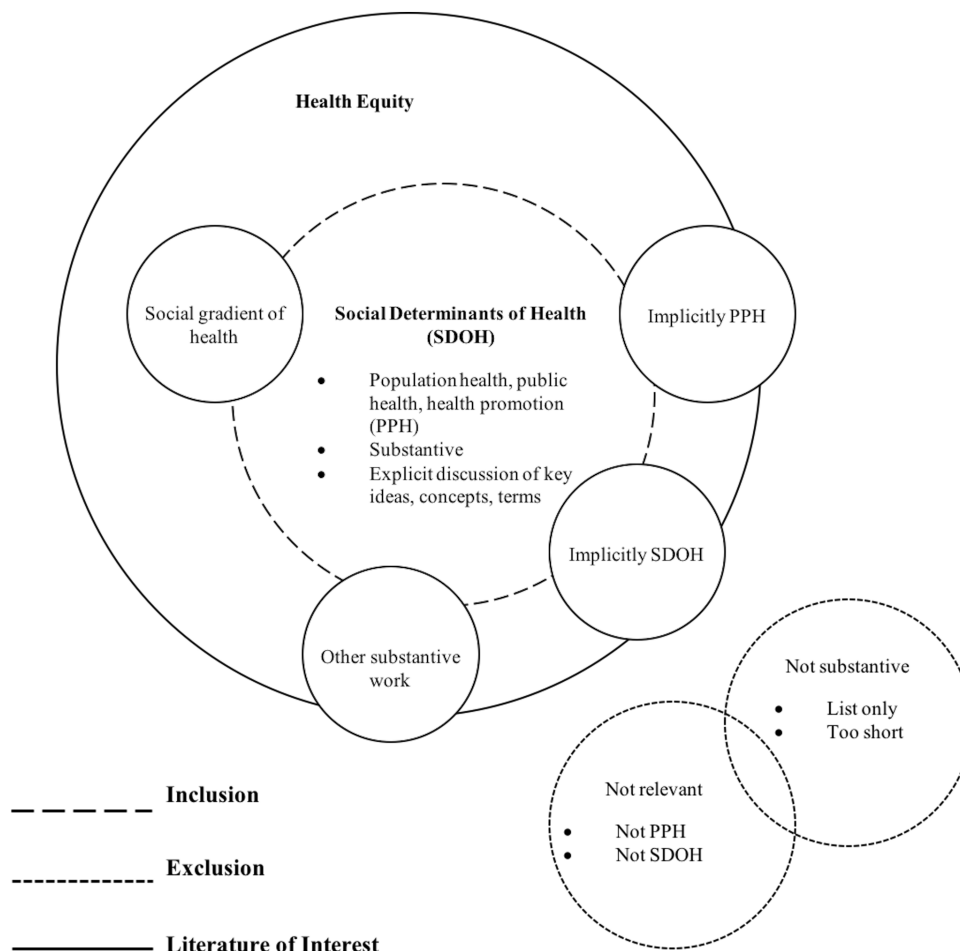


Figure 4: Software architecture diagram for Paper 20.

21.3 Data Parameters

List and describe the data parameters used in the paper.

21.4 Datasets Used

Describe the datasets used in the paper and their significance.

21.4.1 Paper Link

Access the full paper at <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0177306>.

22 Paper 21: Impact of Social Determinants of Health on the Emerging COVID-19 Pandemic in the United States

Journal/Conference Rank: Q1

Publication Year: 21 July 2020

Reference: [5]

22.1 Summary

Social determinants of health (SDOH) have had a big influence on health outcomes during the COVID-19 pandemic. Making the right health choices requires having a basic understanding of and capacity to analyze health information. Poorer health outcomes are linked to low health literacy, particularly during pandemics. Personal health outcomes depend on having access to healthcare, yet many individuals encounter obstacles such as poor transportation, a lack of insurance, inadequate knowledge, and few money. Lower-income and minority communities are disproportionately affected by these obstacles.

Low income is associated with hypertension and CKD because healthy meals, processed meats, and lipids are more expensive. Low earnings and food deserts raise the likelihood of obesity, which in COVID-19 patients is a major predictor of hospitalization. When it comes to healthcare, systemic and interpersonal prejudice often benefits the wealthy and powerful.

Individual well-being depends on social support, and social cohesiveness denotes close ties and shared values among community members. To maintain social cohesiveness and communication throughout the epidemic is crucial for overall wellbeing. Health and quality of life depend on having access to nutritious meals, but obstacles like poor mobility and food deserts may make this difficult.

Since the epidemic, millions of individuals have experienced unemployment and job loss, raising concerns about the stability of the economy. To address these concerns, SDOH measures for reducing health and healthcare inequalities must be put into practice.

22.2 Software Architecture

This paper describes the five determinants of social health.

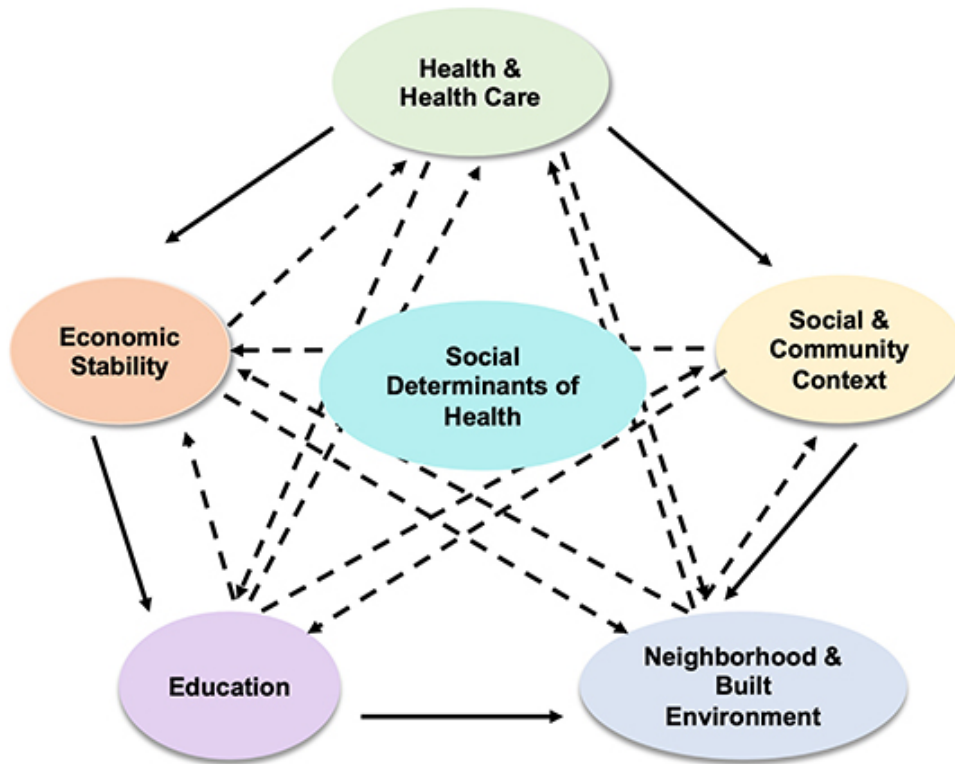


Figure 5: Software architecture diagram for Paper 21.

22.3 Data Parameters

Social disparity, public health, food, the economy, education, SARS-CoV-2, COVID-19

22.4 Datasets Used

Datasets are used from the number of covid-19 cases/days.

22.4.1 Paper Link

Access the full paper at <https://www.frontiersin.org/articles/10.3389/fpubh.2020.00406>.

23 Paper 22: Impact and variability of social determinants of health on the transmission and outcomes of COVID-19 across the world: a systematic review protocol

Journal/Conference Rank: Q1

Publication Year: 1 December 2021

Reference: [5]

23.1 Summary

The COVID-19 pandemic has highlighted health inequalities and the impact of socioeconomic factors of well-being (SDOH) on the state of health. WHO states that non-medical factors affect medical results and that socioeconomically poor regions have very little access to healthcare services. Access to healthcare is essential for achieving the best possible health outcomes, yet those without access are suffering because of inequities in insurance and service provision. Health insurance is crucial in lowering unreported cases and promoting preventive measures, especially in historically impoverished regions. SDOH is crucial for comprehending preventable health inequities and improving outcomes, especially for those who fall most at risk. This data aids in categorizing groups at risk and correctly modifying health messaging. This systematic study examines the impact of socioeconomic factors on COVID-19 transmission and outcomes, with a focus on regional variations. The evaluation will include case-control, cross-sectional in predesign-postdesign, and modeling studies that show statistically significant connections between exposures interesting (SDOH) and COVID-19 transmission and outcomes. The population being studied will include people of different ages, backgrounds, genders, and regions. Outcome measures will be employed if they use a measure for SDOH which could affect COVID-19 transmission and results. Using PROGRESS-Plus and people in good health 2020, SDOH will be classified. Ten academics will review the abstracts and title pages of potential articles before screening the whole texts for inclusion. The review will examine positive COVID-19 cases, hospitalization related to COVID-19, and deaths caused by COVID-19. It is broad and exploratory in nature and has no intention of doing a meta-analysis. The results will be totaled and collated in order to give an empirical understanding of pandemic response activities and their effects on public health policy.

23.2 Data Parameters

Public health, pandemic, statistics, COVID-19, and SDOH.

23.3 Datasets Used

Datasets are used from various table data.

23.3.1 Paper Link

Access the full paper at <https://bmjopen.bmj.com/content/11/12/e053481>.

24 Paper 23: Social determinants of health: The how, who, and where screenings are occurring; a systematic review

Journal/Conference Rank: Q1

Publication Year: 20 August 2019

Reference: [5]

24.1 Summary

Health promotion is crucial in order to deal with social aspects of health such socioeconomic status, power, and resource accessibility. Social determinants include things like trauma contact, education, transportation, access to resources, and support from others. In order to reveal socioeconomic and demographic determinants on health and care access and consequently improve health equity, collaboration among professionals must screen for these characteristics. For people with poor English proficiency or illiteracy, access to vital hospital, health care, and healthcare services is crucial. High-quality, encouraging social networks are essential for maintaining both physical and mental health, increasing stress resistance, minimizing trauma-related psychopathology, and reducing morbidity and mortality in the medical field. Low levels of companionship may increase mortality and morbidity while high levels function as a buffer against every aspect of any kind of sickness. Social support and social factors are crucial for addressing poverty, hunger, health literacy, transportation, lodging, employment, and trauma history. You may find these components by doing a thorough search of the literature using Boolean operators like "AND test OR screening instrument." Social factors affecting health, including food insecurity and health literacy, have a significant influence on healthcare settings. There were eight screening tools for assessing food insecurity, of which four were reliable and five were valid. The three most often used tools for assessing health literacy are the Newer Critical Sign (NVS), its Rapid Estimate of Literacy among Adults of Medicine (REALM), and the Newest Vital Sign. The study suggests that physicians should consider the administration style when assessing medical literacy along with food insecurity in hospitals. Insecurity over food is an important social indicator of health, requiring further research and healthcare reform in order to boost population health and get health equity.

24.2 Software Architecture

This paper describes the five determinants of social health.

24.3 Data Parameters

health care, primary care, inter-professional practice, integrated care, social determinants of health.

24.4 Datasets Used

Various tables and charts of data are used to create datasets. The paper's primary emphasis is public health screening.

24.4.1 Paper Link

Access the full paper at https://www.researchgate.net/publication/335294891_social_determinants_of_health

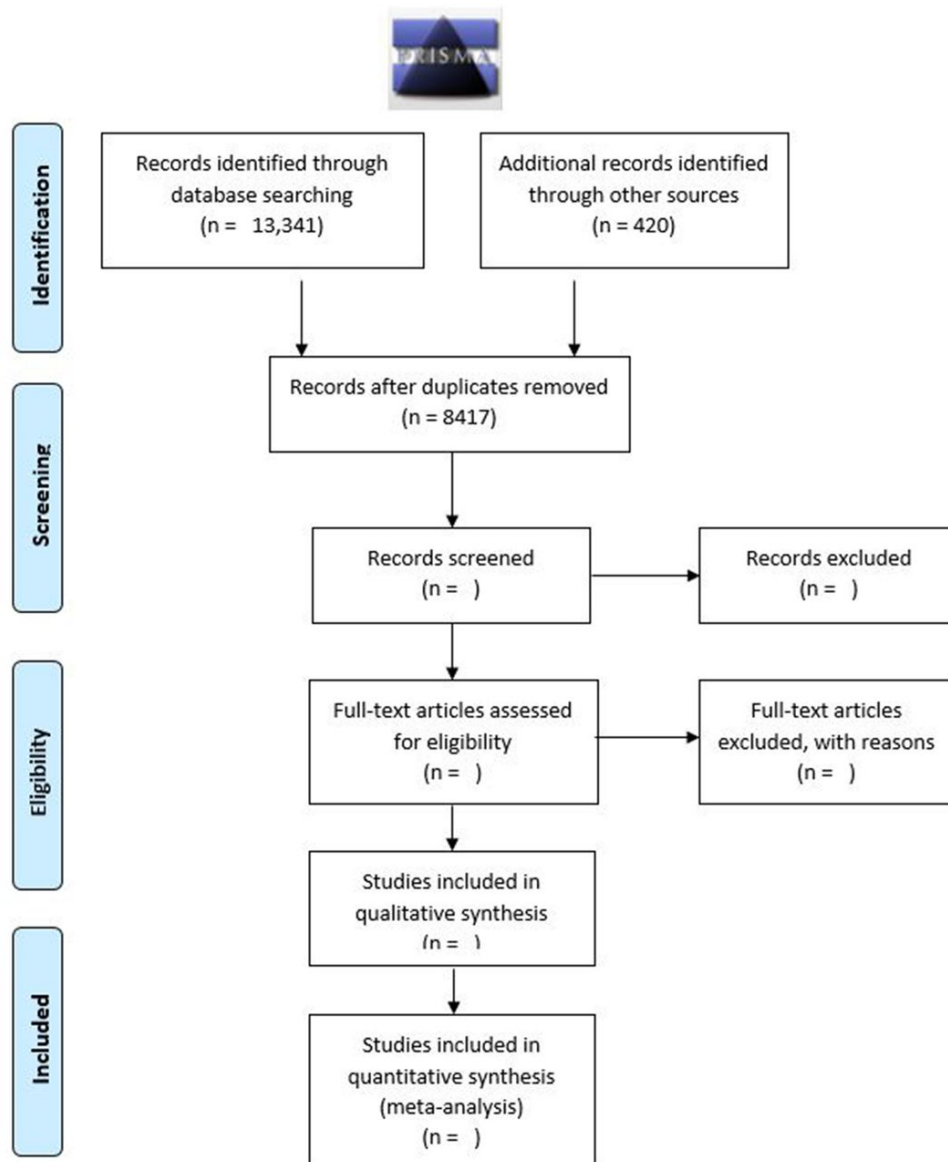


Figure 6: Software architecture diagram for Paper 23.

25 Paper 24: Moving Toward Health Equity by Addressing Social Determinants of Health

Journal/Conference Rank: Q1

Publication Year: 3 November 2019

Reference: [5]

25.1 Summary

Social variables of health including racism, poverty, and substandard housing have a significant impact on health inequities. Birth, development, and aging are factors that affect chronic disease and early aging. Nurses play a vital role in resolving these issues by providing patient-centered care, addressing complex social needs, and working for system-level change. For example, Jessica, a bipolar homeless person, experienced housing and

money issues as a consequence of her family's inability to support her. Nurses need to be aware of these characteristics in order to promote healthy pregnancies and manage chronic conditions including hypertension and heart disease. Addressing these issues is necessary for enhancing well-being and health, resolving systemic issues, and promoting system-level change. To avoid health disparities and worse care, nurses must address socioeconomic variables of health such as inadequate housing, type 2 diabetes, and prenatal care. To promote health equity, nurses must examine their own prejudices and focus on interpersonal abilities including compassion, perspective-taking, emotional management, and patient cooperation. The first step is to perform a screen for social components of health. Proven tools such PRAPARE and the Social Needs Assessment Tool developed by the American Society of Family Practitioners may help in identifying influencing factors and linking patients to the assistance and services they need. Nurses may also form partnerships, provide incentives to patients, and develop programs to deal with the societal problems that women say they need help with the most. To overcome these factors, cutting-edge cross-sector collaboration methods and software technologies like Unite Us and Healthify are needed in addition to coordinated and effective cross-sector cooperation. Nurses may find and establish partnerships to bridge the gaps between women's societal needs and the services offered by the healthcare system. Nurses are crucial in addressing socioeconomic health factors, which are particularly harmful to women's health. They support community-level programs and Health in Every Policy policies that focus on structural concerns including food stamps, access to psychological treatment, and social reforms in order to enhance health equity and decrease healthcare costs.

25.2 Software Architecture

This essay explores systemic problems and advocates for systemic reform.

25.3 Data Parameters

Life span, quality of life, socioeconomic status, social aspects of health, and health equality

25.4 Datasets Used

Datasets are drawn from a variety of tables that are implemented by multiple software sources.

25.4.1 Paper Link

Access the full paper at <https://www.sciencedirect.com/science/article/pii/S1751485119302284>.

26 Paper 25: A Systematic Literature Review of Nutrition Interventions Implemented to Address Food Insecurity as a Social Determinant of Health

Journal/Conference Rank: Q1

Publication Year: 5 August 2023

Reference: [5]

26.1 Summary

This systematic review assesses three nutritional interventions: produce prescription applications medically customized suppers, and community-supported agriculture in order to address hunger as a social determinant of health. The primary outcomes that were evaluated were changes in self-reported food consumption. The review's findings suggest that further study is needed to determine how feasible and cost-effective such medications are, especially in areas with young people. Eliminating hunger may reduce the need for and expense of healthcare since it is associated with food intake, a person's body mass index (B), and health outcomes. The Gus Schneider Nourishing Reward Program (GusNIP), a nonprofit organization, encourages people with modest incomes to buy more fruits and vegetables. The USDA has granted its approval. BMI decreases, dietary intake modifications, food insecurity, condition improvement, potential, and cost-related outcomes were the main topics of an extensive study of 21 research on nutritional strategies to alleviate food poverty. The research looked at changes in a person's body mass index (B), food consumption, chronic diseases, results relating to feasibility, and cost-related outcomes. The vast majority of the participants were women. The USDA has been investigating nutrition-related treatments to reduce food poverty as a social indicator of health. Produce or foodstuff prescription programs are the topics that are most often studied, with adult populations receiving 61.9 percent of the attention in these research. Since children could maintain good behaviors throughout their lives, further study on children's cultures is required. A meta-analysis found that vegetable intake increased by 22

26.2 Software Architecture

This paper describes a systemetic review.

26.3 Data Parameters

Food insecurity, dietary demands for certain produce, meals cooked under medical supervision, community-supported agriculture, and economic variables that influence health.

26.4 Datasets Used

Various table data are utilized to create datasets. In order to address food insecurity, this research conducts a comprehensive assessment of the literature on various nutrition interventions, with a particular emphasis on BMI, dietary intake, food insecurity, condition improvements, practicality, and cost-related outcomes.

26.4.1 Paper Link

Access the full paper at <https://www.mdpi.com/2072-6643/15/15/3464>.

27 Discussion and Future Planning

Describe the commonalities, variances, and trends found in the studies under examination. Write about the concepts and techniques you want to use, and point out any gaps in the literature or prospective topics for further study.

28 Rich Picture + Data Model Submission

28.1 Rich Picture

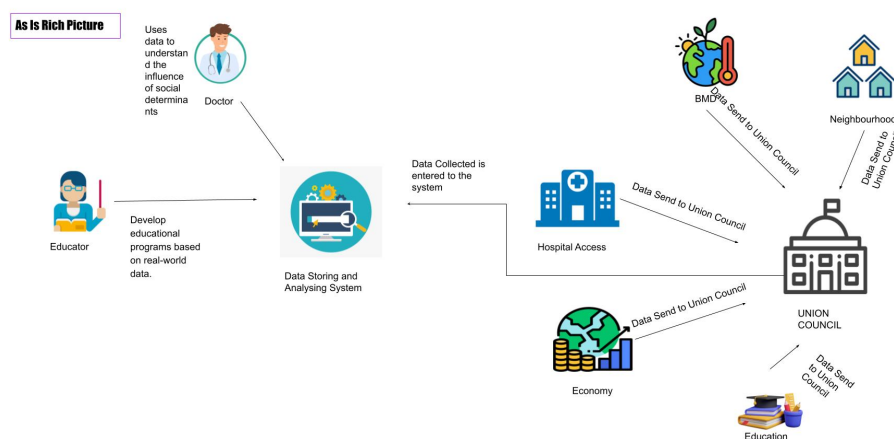


Figure 7: As-is rich picture

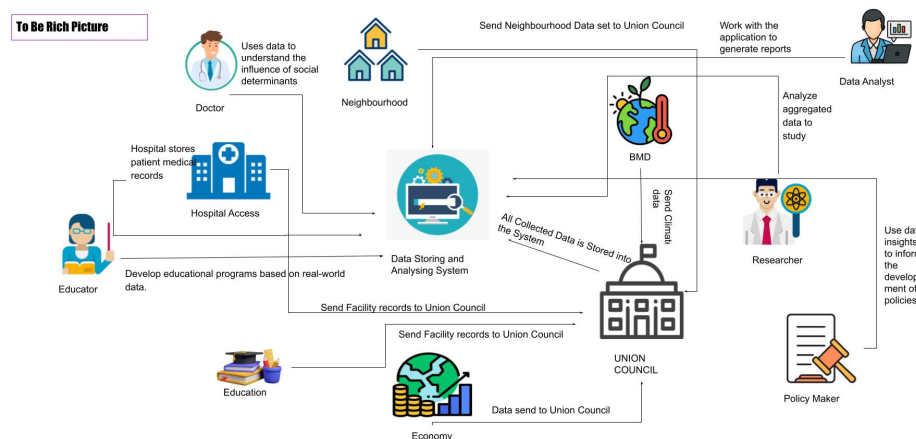


Figure 8: To-be rich picture

28.2 ERD

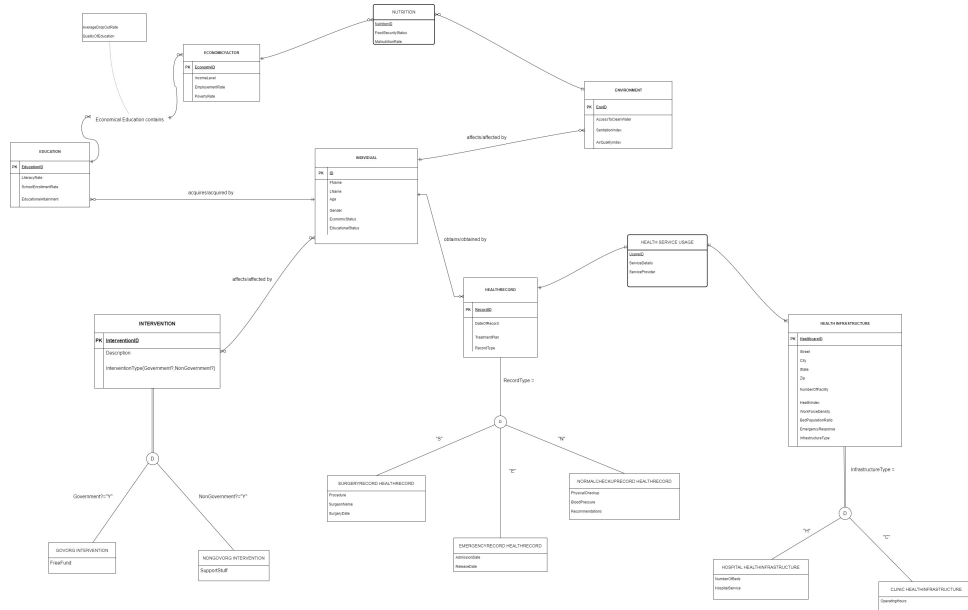


Figure 9: ERD.

28.3 Schema

Entity Relationship Diagram to Relational Schema

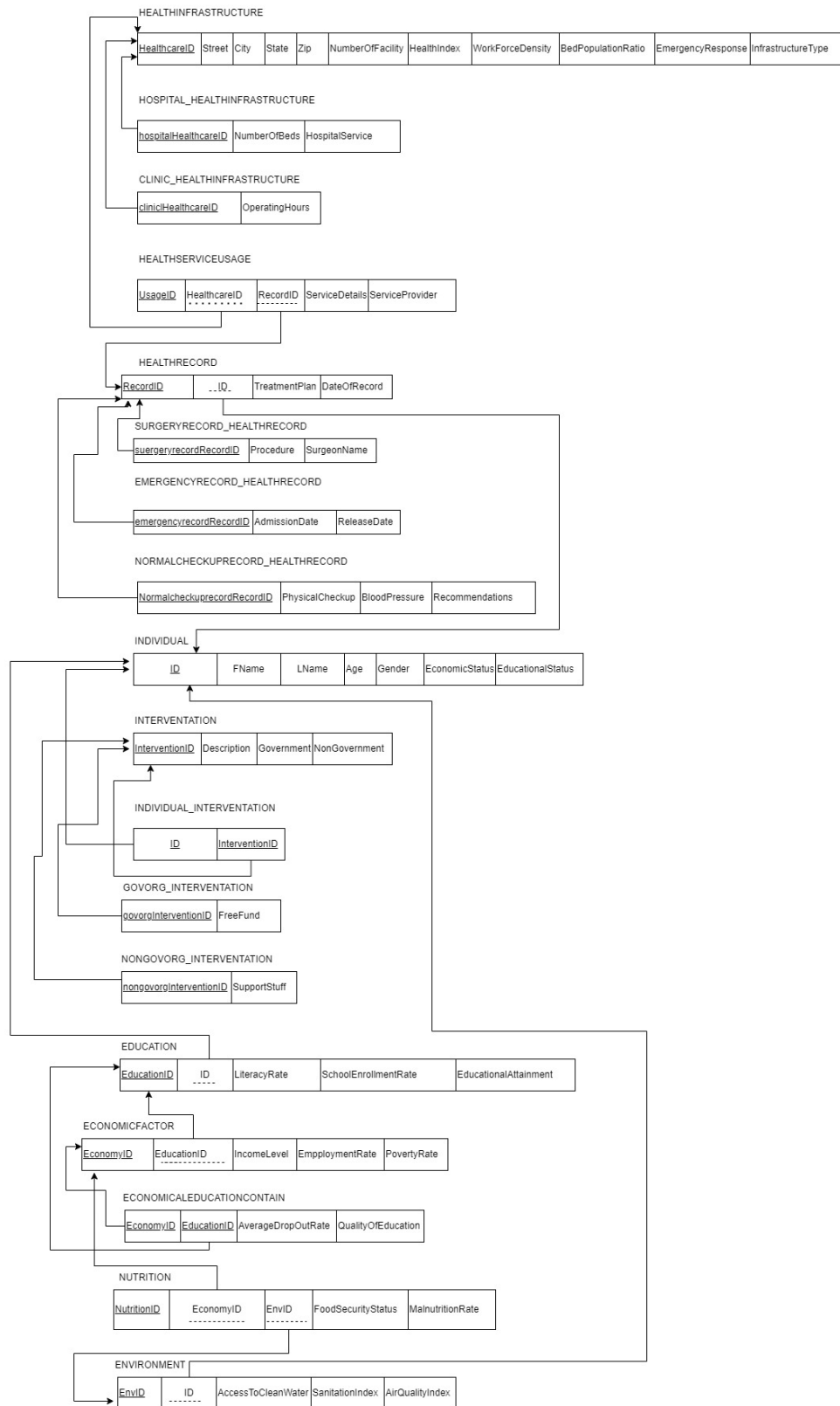


Figure 10: Schema

28.4 Normalized Schema

NORMALIZATION:

HealthInfrastructure	HealthcareID	h1
	Street	h2
	City	h3
	State	h4
	Zip	h5
	NumberOfFacility	h6
	HealthIndex	h7
	WorkForceDensity	h8
	BedPopulationRatio	h9
	EmergencyResponse	h10
	InfrastructureType	h11
HospitalHealthInfrastructure	hospitalHealthcareID	t1
	NumberOfBeds	t2
	HospitalService	t3
ClinicHealthInfrastructure	clinicHealthcareID	c1
	OperatingHours	c2
HealthServiceUsage	UsageID	u1
	ServiceDetails	u2
	ServiceProvider	u3
	HealthcareID	h1
	RecordID	r1
HealthRecord	RecordID	r1
	DateOfRecord	r2
	TreatmentPlan	r3
	ID	i1
SurgeryRecordHealthRecord	surgeryrecordRecordID	s1
	Procedure	s2
	SurgeonName	s3
EmergencyRecordHealthRecord	emergencyrecordRecordID	e1
	AdmissionDate	e2
	ReleaseDate	e3
NormalCheckupRecordHealthRecord	normalcheckuprecordRecordID	n1
	PhysicalCheckup	n2
	BloodPressure	n3
	Recommendations	n4

Figure 11: Table

NORMALIZATION:

Individual	ID	i1
	FName	i2
	LName	i3
	Age	i4
	Gender	i5
	EconomicStatus	i6
	EducationalStatus	i7
Intervention	InterventionID	v1
	Description	v2
	Government	v3
	NonGovernment	v4
IndividualIntervention	ID	i1
	InterventionID	v1
GovOrgIntervention	govorgInterventionID	g1
	FreeFund	g2
NonGovOrgIntervention	nongovorgInterventionID	f1
	SupportStuff	f2
Education	EducationID	l1
	LiteracyRate	l2
	SchoolEnrollmentRate	l3
	EducationalAttainment	l4
	ID	i1
EconomicFactor	EconomyID	p1
	IncomeLevel	p2
	EmployementRate	p3
	PovertyRate	p4
	EducationID	l1
EconomicalEducationContain	AverageDropoutRate	a1
	QualityOfEducation	a2
	EconomyID	p1
	EducationID	l1
Nutrition	NutritionID	m1
	FoodSecurityStatus	m2
	MalnutritionRate	m3
	EconomyID	p1
	EnvID	w1

Figure 12: Table

NORMALIZATION:

Enviornment	EnvID	w1
	AccessToCleanWater	w2
	SanitationIndex	w3
	AirQualityIndex	w4
	ID	i1
EnvironmentIndividual	EnvID	w1
	ID	i1

h1→	h2,h3,h4,h5,h6,h7,h8,h9,h10,h11
t1→	t2,t3
c1→	c2
u1→	u2,u3,h1,r1
r1→	r2,r3,i1
s1→	s2,s3
e1→	e2,e3
n1→	n2,n3,n4
i1→	i2,i3,i4,i5,i6,i7
v1→	v2,v3,v4
il1→	v1
g1→	g2
f1→	f2
l1→	l2,l3,l4,i1
m1,l1→	a1,a2
m1→	m2,m3,p1,w1
w1→	w3,w2,w4,i1

Figure 13: Table



Text

Figure 14: 1NF



Figure 15: 2NF

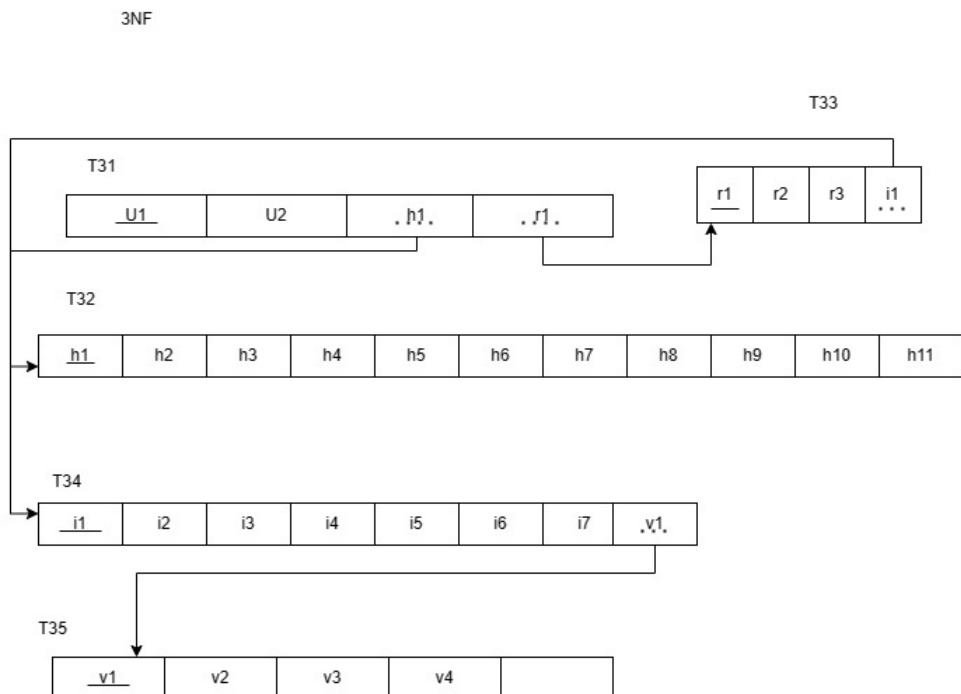


Figure 16: 3NF

28.5 Data Dictionary

HEALTHINFRASTRUCTURE			
Name	Data Type	Size	Remark
HealthcareID	Text	7	This is the primary key of this relation. This contains the ID of the healthcare. Example: '1234567'
Street	Text	6	This contains street name. Example: 'Dhaka'
City	Text	6	This contains city name. Example: 'Dhaka'
State	Text	6	This contains state name. Example: 'Dhaka'
Zip	Number	4	This contains zip code. Example: '1207'
NumberOfFacialty	Number	6	This contains no of facilities. Example: '1232456'
HealthIndex	Number	6	This contains no of facilities. Example: '1232456'
WorkForceDensity	Text	4	This contains workforce density. Example: 'Strong'
BadPopulationRatio	Number		This contains no of bad population ratio. Example: '15.09'
EmergencyResponse	Text	2	This contains emergency response. Example: 'Yes or No'
InfrastructureType	Text		This contains no of facilities. Example: '1232456'

Figure 17: Data Dictionary

HOSPITAL_HEALTHINFRASTRUCTURE

Name	Data Type	Size	Remark
hospitalHealthcareID	Text	7	This is the foreign key. This contains the ID of the healthcare. Example: '1234567'
NumberOfBeds	Number		This contains bed no. Example: '3'
HospitalService	Text	6	This contains health service. Example: 'Admit'

CLINIC_HEALTHINFRASTRUCTURE

Name	Data Type	Size	Remark
clinicHealthcareID	Text	7	This is the foreign key. This contains the ID of the healthcare. Example: '1234567'
OperatingHours	"hh:mm:ss"		This contains date of time of operating hours. Example: 12:10:05 am

Figure 18: Data Dictionary

HEALTHSERVICEUSAGE

Name	Data Type	Size	Remark
<u>UsageID</u>	Text	7	This is the foreign key. This contains the ID of the healthcare. Example: '1234567'
HealthcareID	"hh:mm:ss"		This contains date of time of operating hours. Example: 12:10:05 am
RecordID	Text	7	This contains Record ID. Example: '1232456'
ServiceDetails	Text	8	This contains service details.
ServiceProvider	Text	7	This contains service provider details.

HEALTHRECORD

Name	Data Type	Size	Remark
RecordID	Text	7	This is the foreign key. This contains the ID of the Health record. Example: '1234567'
ID	Text		This contains the ID . Example: '1234567'
TreatmentPlan	Text	10	This contains the treatment plan .
RecordType	Text	8	This contains the what kind of record.

Figure 19: Data Dictionary

29 Methodology and Implementation:

29.1 End User Interface

The End User Interface Dashboard is a user-centric platform that provides real-time information to farmers, enhancing their overall well-being. It offers weather analytics updates, daily dietary notifications, and a nutrition intake tracking feature, allowing users to track their nutritional progress. The dashboard's functionality includes displaying services tailored to farmers and providing insights into weather conditions relevant to their agricultural activities.

The dashboard also features an intuitive input form for data interaction, allowing users to input details about their meals, and the dashboard dynamically updates to reflect their nutritional progress. The Administrator Interface processes and manages end-user data submitted through the nutrition intake tracking feature, contributing to analytical reports and enhancing services.

The Staff Interface offers one-to-one chat functionality for personalized assistance in case of queries or issues related to the displayed services. The dashboard fetches real-time weather data, providing farmers with analytics updates, and helping them make informed decisions about their agricultural activities. Users can also track their nutrition intake by entering details about their meals, enabling them to monitor their dietary habits.

The dashboard's integration with the Administrator Interface ensures that user-generated data contributes to continuous improvements and personalized services. It serves as a holistic tool for users to stay informed and make informed decisions related to weather-dependent activities and health-conscious choices.

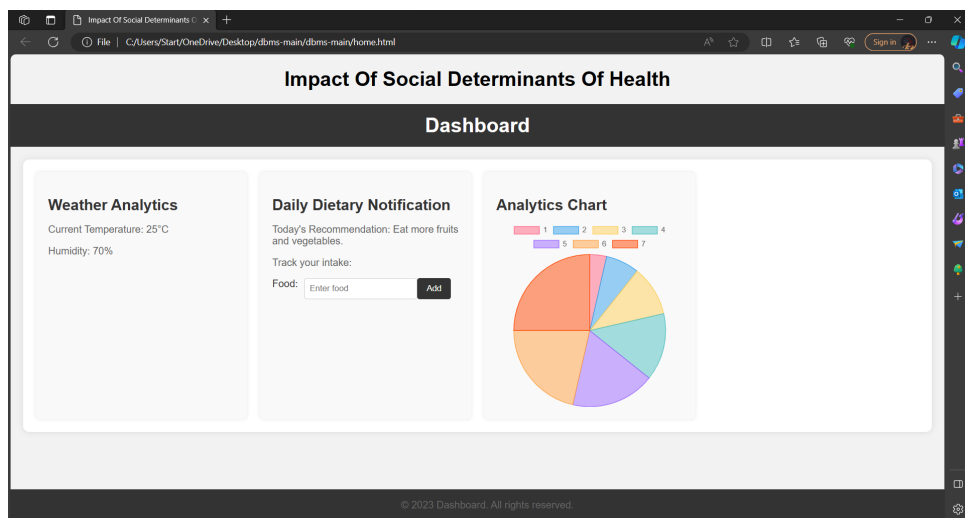


Figure 20: Screenshot of End User Interface

29.2 Landing Page or User Sign-up

The User Sign-up Functionality Methodology is a crucial aspect of a user-friendly dashboard, enabling users to create personalized accounts and access dashboard features. Its primary objectives are to collect user information, establish unique accounts, and facilitate a seamless onboarding process. The functionality includes account creation, data validation, security measures, confirmation and authentication, user profile setup, error handling and feedback, and Terms of Service and Privacy Policy.

Account creation involves users entering their details into the form, including a valid email address and secure password. Data validation ensures the accuracy and security of user-provided information, and users receive a confirmation email with a verification link or code to authenticate their accounts. Users can optionally complete their profiles with additional information, and they agree to the Terms of Service and Privacy Policy as part of the sign-up process.

After successful validation and confirmation, the user account is created, and users can log in to the dashboard using their credentials. The User Sign-up functionality establishes a secure and user-friendly onboarding process, ensuring that users can access and benefit from the features provided by the dashboard. Clear communication, validation checks, and optional profile setup contribute to a positive user experience, laying the foundation for ongoing user engagement.

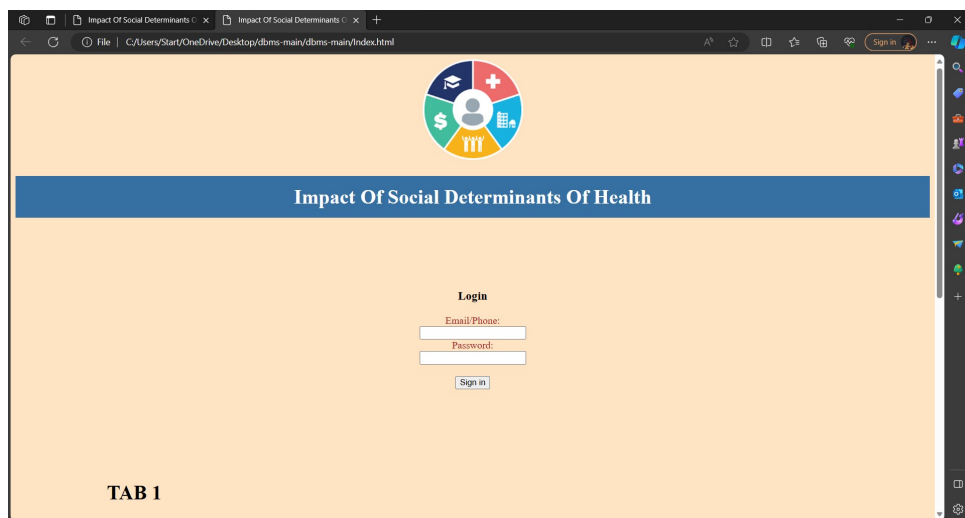


Figure 21: screenshot of Landing Page or User Sign-up

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