Public Health 2030:

Scenarios for Fargo Cass Public Health, North Dakota

Institute for Alternative Futures

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by Fargo Cass Public Health
and the Institute for Alternative Futures

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Using These Scenarios

Comparable organizations and communities can use these scenarios as a living tool for strategy formulation by using them to:

1. Test whether current strategies will be effective in the different scenarios.
2. Formulate strategies to more effectively adapt to the changing environment.
3. Assure that strategic plans address the larger picture and longer-term futures for the public health community.

To use these scenarios in your own scenario workshop, visit *www.altfutures.org/publichealth2030* for a sample workshop agenda, instructions, worksheets, and presentation materials.

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Introduction

What will public health in the U.S. look like in 2030? What should public health leaders be doing today? The *Public Health 2030: Scenarios for Fargo Cass Public Health, North Dakota* offer a tool for Fargo Cass Public Health (FCPH) and other comparable local health departments to explore these questions at the level of their own jurisdictions. Scenarios can become a living tool for strategy formulation by allowing organizations to test and design current strategies to be effective in the different scenarios. Using these scenarios can help leaders and their organizations more effectively adapt to the changing environment. The scenarios consider a range of forces, challenges, and opportunities shaping local and national public health. They also offer a plausible set of expectable, challenging, and visionary pathways for how public health in the City of Fargo and Cass County, North Dakota, may change over the years to 2030, and what FCPH's role might be within these pathways.

Using preliminary sets of these scenarios, IAF designed and facilitated a scenario workshop with FCPH staff and leaders to explore the four scenarios on December 12, 2013 in Fargo, North Dakota. Together the participants considered potential public health goals and strategies for the future, as well as implications for the "robustness" of their current strategies in light of the various scenarios. The recommendations that they developed for FCPH represent steps toward better public health futures for the City of Fargo and Cass County, and deserve support to promote and develop more effective public health. To use the finalized scenarios in your own workshop, visit *www.altfutures.org/publichealth2030* for instructions, sample agendas, and presentation slides.

These Public Health 2030 scenarios for FCPH and others are an important part of a larger project – Public Health 2030 – conducted by the Institute for Alternative Futures (IAF) and supported by the Kresge Foundation and the Robert Wood Johnson Foundation. In addition to developing scenarios for public health departments from four jurisdictions, including FCPH, IAF developed a set of national public health scenarios available at *www.altfutures.org/publichealth2030*. Leaders and practitioners in public health and other sectors can consider their own work in the context of these national scenarios by challenging their own assumptions about the future, identifying emerging risks and opportunities, and formulating more robust strategies with greater potential to advance their mission over the decades to come.

Why Scenarios?

The future is uncertain. However, scenarios – different stories describing how the future may unfold – can be used to bound that uncertainty into a limited number of paths. These paths help us think about different probabilities in a larger space of possibilities. Scenarios also force us to consider the systems surrounding our topic and to clarify our assumptions. People who work with scenarios find more creative options than those who plan based only on the past and present. Strategies, plans, and actions can be "future tested" against the different scenarios to assure robust initiatives, rather than continued efforts based on outdated assumptions. Scenarios are thus a powerful method for systematically addressing the uncertain future.

Process of Developing These Scenarios

Given the diversity of public health agencies across the U.S., IAF determined that we should develop scenarios for a few state and local public health agencies. In selecting jurisdictions, we sought diversity in size, region, political and economic conditions, and organizational forms. We chose a rural jurisdiction, a mid-sized jurisdiction (population of 250,000 to 750,000) and a large jurisdiction (population over 750,000). With assistance from the National Association of City and County Health Officials (NACCHO), we recruited FCPH as a rural jurisdiction case. We are grateful for the partnership of Ruth Bachmeier, director of Fargo Cass Public Health.

IAF partnered with FCPH staff to develop the scenarios using the "Aspirational Futures" approach (see **Figure 1** below) which IAF has evolved over the last three decades. The "aspirational futures" approach helps people understand and clarify where current trends may take us, what challenges we face, and what success might look like. This technique develops forecasts and scenarios in three zones:

- A "zone of conventional expectation" reflecting the extrapolation of current trends, a "most likely" or expectable future (scenario 1);
- A "zone of growing desperation" which presents a set of plausible challenges that an organization or field may face, a challenging future (scenario 2); and
- A "zone of high aspiration" in which a critical mass of stakeholders pursues visionary strategies and achieves surprising success (scenarios 3 and 4). Two scenarios are developed in this zone in order to offer two alternative pathways to highly preferable or visionary futures.

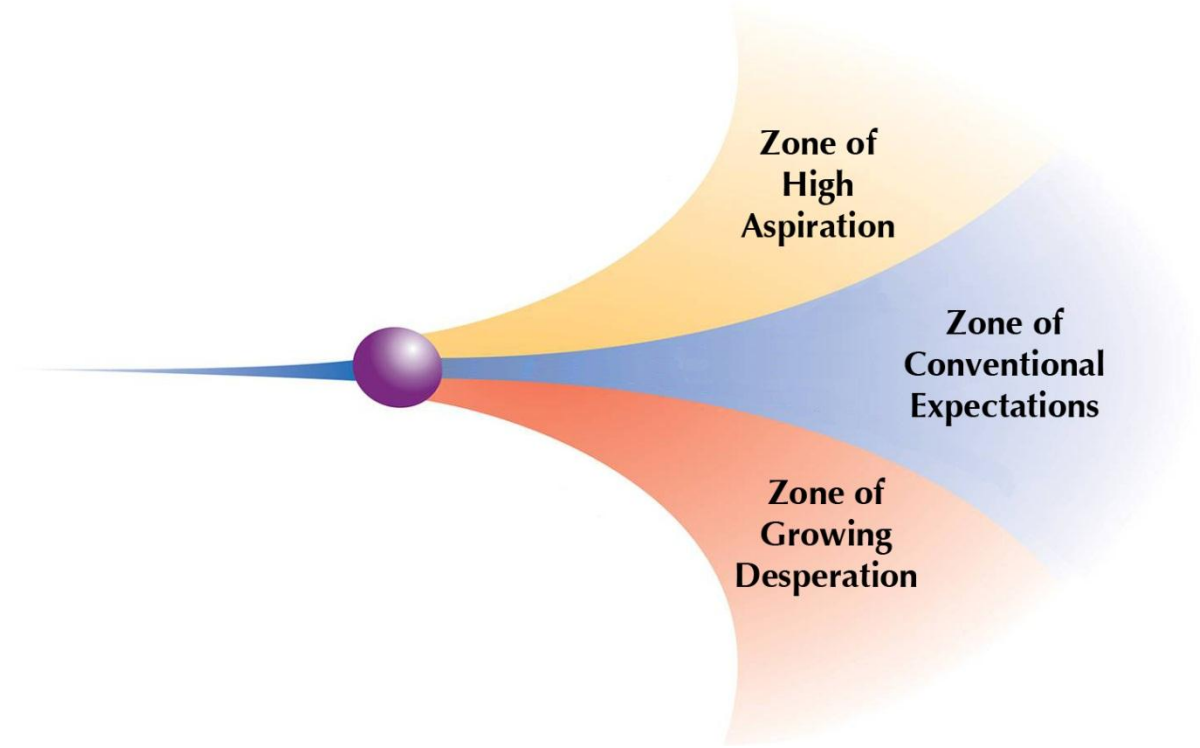

Figure 1: IAF's "Aspirational Futures" Approach

In developing these scenarios, IAF reviewed key FCPH program areas, plans, and documents, and interviewed individual FCPH program staff using a set of "driver forecasts" related to key factors shaping health. Based on this research, IAF then developed preliminary scenarios for review and discussion. Many of the comments we received during a FCPH scenario workshop held on December 12, 2013, have been incorporated into the final scenarios.

In the next section, we present the finalized scenario narratives, followed by a matrix that allows for side-by-side comparison of the scenarios across multiple categories.

Public Health 2030: Scenarios for Fargo Cass Public Health

Scenario 1: Fargo Forward

Scenario Overview

Over the years to 2030, Fargo Cass Public Health (FCPH) used technology, games and simulations, and the spread of electronic health records to improve surveillance, health care, and other FCPH services, and promote health. Growing environmental challenges also required the expansion of emergency preparedness and awareness services. An ammonia spill disaster prompted residents to take the role of public health more seriously than before, and FCPH expanded its prevention activities. In 2030, FCPH is respected as an advocate for sensible public health policies, as a community educator, and as a partner of many community groups.

Scenario Narrative

Over the years to 2025, the population in Cass County and Fargo grew larger and older. The number of county residents grew from 150,000 in 2010 to 185,000 by 2025. Within Fargo itself, the population grew from approximately 106,000 in 2010 to approximately 135,000 in 2030. Fargo Cass Public Health (FCPH) grew in staff size as well while it adjusted to a rapidly aging population, the impacts of climate change, and other developments that affected its services.

In health care, FCPH reduced its work in direct clinical services over the 2010s as care became more and more accessible to residents. This shift freed FCPH to focus on prevention, protection, and assurance (particularly as related to emerging issues brought about by aging and climate change). For example, nursing programs at FCPH shifted from directly delivering immunizations to providing assurance.

However, FCPH continued to directly provide case management, particularly for the most vulnerable, those with mental health problems, the elderly, refugees, and “new Americans.” FCPH took advantage of the expansive use of electronic health records (EHRs) to improve its case management. With the largely successful implementation of the Patient Protection and Affordable Care Act (PPACA), EHRs that were highly interoperable and updated regularly or in real-time had spread among local providers. Health care providers (Accountable Care Organizations, hospitals, community health centers, and individual practitioners) pooled their EHR data, generating automatic information on reportable cases, as well as higher-level surveillance of infectious and chronic disease patterns.

Gaining direct access to EHRs also helped FCPH conduct surveillance tasks more quickly. Surveillance had become increasingly important as climate change and various environmental emergencies increased the prevalence of certain infectious diseases, mold, and other health-threatening conditions. On the other

hand, climate change had also led to the most profitable six years in local farming history between 2007 and 2012 (due to the longer growing season). However, this productivity soon came to an end with increasing extreme and repeated summer droughts, along with wetter fall, winter, and spring seasons. Over the 17 years between 2013 and 2030, this resulted in three significant floods, with water levels rising to at least 40 feet each time. Furthermore, to the surprise of many, cases of dengue fever occasionally appeared during times of high mosquito prevalence, often carried into the region by visitors returning from infected zones.

FCPH's emergency preparedness services expanded in response to these environmental challenges. FCPH emergency preparedness staff coordinated with the Public Information Officer to improve residents' knowledge of how to prepare themselves for various types of emergencies, including chemical spills, oil spills, tornadoes, floods, heat waves, and outbreaks of influenza and other diseases. These efforts were organized under a "Fargo Emergency Preparedness and Awareness" (FEPA) public health campaign, FCPH partnered with local groups and the University of North Dakota (UND) to increase the prominence FEPA among residents via social media, games and gamification, community and school events, and simulations.

Although FCPH had done more than many other public health agencies (PHAs) to prepare residents for emergencies, it could not remove feelings of complacency and false security among many members of the community, particularly among the older, more "weathered" residents who had been through previous floods and tornadoes in the area. Residents had also continued to accept the trains passing through Fargo that carried oil and hazardous materials. In 2020, a derailment west of University Drive led to a major explosion and several leaks of anhydrous ammonia. The response to this disaster among the public was less than ideal. Many residents were unsure of how to remain safe from chemical spills and the spread of anhydrous ammonia. FCPH's Public Information Officer, FCPH's emergency preparedness services, and even the Family HealthCare Center and other community partners had helped to spread word in the past about how to prepare for chemical spills and toxins. However, many residents had not viewed such emergencies as likely. As local residents close to the spill were exposed to the anhydrous ammonia, and did not know how to respond to the threat of the gas (which winds helped spread for several blocks), they experienced coughing, chest pains, and even burns and blisters. Local hospitals and health centers saw an influx of patient cases with varying intensities of eye, nose, and throat irritations and damage.

The "ammonia spill" led formerly complacent residents to recognize the need for emergency preparedness and awareness. It also increased the visibility of FCPH and public health's broader role in outreach, emergency preparedness, and prevention of injury or disease. After the ammonia spill, residents were more understanding of public health's broader role in their wellbeing. To ensure that residents were prepared for a potentially worse disaster, FCPH ramped up its activities in emergency preparedness, environmental health, outreach, and overall behavioral health.

In addition to accessing EHR data, FCPH also drew on other technologies to enhance its inspections and surveillance. FCPH partnered with UND to use remotely piloted vehicles (RPVs) to conduct surveillance, inspection, and monitoring during and after emergencies. The use of RPVs saved time and transportation costs, and FCPH accessed data from the RPVs during both times of emergency and times of normalcy. Video monitoring and its automated analysis became relatively inexpensive as well, facilitating near continuous monitoring. This data was aggregated into scores or ratings overseen by FCPH. The results were regularly updated for the public and were included in consumer rating services such as Yelp! and Urban Spoon. FCPH also took advantage of increased air and water quality monitoring

by public, corporate, and citizen monitoring efforts. That information (along with data from RPVs) enhanced local early warning and response systems.

As residents' understanding of and participation in public health services thus grew, FCPH expanded its prevention activities. In tobacco control, Fargo had been leading North Dakota for decades in establishing smoking restrictions and promoting the state regulations. In 2013, Fargo's smoking rates had been reduced to 13% for youth and 22% for adults. However, e-cigarettes had begun to displace tobacco. Regulations were eventually put in place to prevent sales of e-cigarettes to those under 18, and to further limit second-hand exposure to e-cigarette vapors. Rates for tobacco use declined as e-cigarette use increased. In the mid-2010s, after much debate, e-cigarettes were added to the 2012 statewide measure banning cigarette use in bars, taxis, motels, and private nursing homes. FCPH worked with the Fargo Police and the Cass County Attorney in assuring that establishments comply with the ban. As a result, lung cancer rates declined steadily over the years to 2030.

In light of technological developments as well as increasing public awareness of public health activities, FCPH took on interdisciplinary teams of interns (including MPH students or graduates, or those with technical training from UND, Microsoft, or North Dakota State University ([NDSU]). These intern teams joined in monitoring, research, and quality assurance, and used evidence-based best practice guidelines to evaluate FCPH activities. Evidence-based and cost-effective practices, such as well-designed automated inspection, had become commonly implemented across public health programs. For example, throughout the 2010s and 2020s, FCPH increasingly used technologies such as telemedicine, games, and simulations for correctional health and home health services, combating substance abuse, and enhancing tobacco control (which benefited from tobacco settlement funding until 2025). The integration of various communications technologies into these efforts was particularly well-supported after research had shown that the North Dakota "Quit Line" phone system and interactive computer programs were more effective than personal counseling for lowering smoking and substance abuse rates. As smart phones became more commonplace, telemedicine did not replace direct human interactions but helped improve access to care for low income and many vulnerable populations who used their phone for personal health monitoring as well as for Skype-like interpersonal calls. This aided FCPH's outreach efforts to vulnerable populations, groups of seniors, refugee communities, and hard-to-reach subgroups.

In conjunction with improving outreach efforts, FCPH enhanced its role in facilitating or leading community coalitions to address the social determinants of health and behavioral health. FCPH's activities particularly focused on promoting physical activity, improving mental health (including substance abuse), providing healthy aging services, and increasing access to healthy food. In addition to leading the Metropolitan Food System Plan, FCPH stimulated many community collaborations to map community conditions, develop available land into community gardens or safe physical activity spaces, increase neighborhood safety, and develop "complete streets." The late 2010s and early 2020s saw an accelerated uptake of undeveloped lots and land for commercial purposes, community gardening, homesteading, and redevelopment. To monitor and evaluate these new spaces and activities, and to enhance engagement with the community, FCPH drew on citizen science groups, health technologies, mobile apps, social media, and the stream of technologically adept young adults at NDSU and Microsoft.

In 2030, FCPH is respected as an advocate for sensible public health policies, as a community educator, and as a partner of many community groups. FCPH does not serve as a lobbyist, but generally finds local political and legislative support for its activities. Residents take the role of public health more seriously than before, given their experience with the ammonia spill disaster in 2020. The disaster reduced

complacency among residents, and FCPH drew on community assets, emerging technologies, and social media platforms to increase community preparedness and resilience, and to enhance early warning and response systems. FCPH has also enjoyed relatively stable funding from the city, the county, West Fargo, and the state government. FCPH took advantage of this financial stability to support continuous quality improvement (partially through using games and simulations to assess employees and/or job applicants' knowledge and skills) train employees, and develop emergency response capabilities. Increased demand for FCPH leadership and services, along with consistent funding, helped FCPH grow its staff from 135 to 170 by 2030. In 2030 FCPH continues as a city/county agency, but has expanded its collaborations with other health departments in the region and thus provides a growing array of surveillance, analysis, and policy advice.

Scenario 2: UFF-DA! & the Flood of 2020

Scenario Overview

Environmental challenges plaguing Fargo and Cass County escalated. Although FCPH led a successful evacuation of Fargo City with the support of partners, a major flood in 2020 ultimately further damages the region's personal and economic health. Further, health care reform stalled and access to health care grew more limited. Significant funding and staffing cuts forced FCPH to concentrate on crises, rather than prevention. By 2030, health disparities had grown stark and many were skeptical that the region will ever be able to return to the levels of health seen just two decades earlier.

Scenario Narrative

The regional economy around Fargo remained in good shape for the first half of the 2010s. Its major employers—Sanford Health System, North Dakota State University (NDSU), Fargo Public Schools, and Microsoft—all had experienced growth in revenue and/or workforce size. City and county revenues had continued to grow. Local large farms prospered. So long as the agricultural sector thrived, so did the City of Fargo. However, that changed dramatically as the result of environmental and economic challenges.

For farmers, the growing seasons had grown increasingly longer over the past, but over the 2010s the gains were offset by major droughts and some flooding that hurt agricultural production in the region. In 2014, the State saw the first of four consecutive severe droughts. Most farmers produced only a fraction of their usual harvest. In the worst years, some farmers could produce no harvest at all during typical harvesting times.

These excessively dry conditions were abruptly reversed in 2019 and 2020, and the Fargo-Cass region suffered for it. The snow that started in October of 2019 (children were trick-or-treating in three inches of snow) was the opening blast of a severe winter that left deep snow. By early spring, little of this snow had melted. When temperature levels shifted rapidly in April, several record-breaking warm days produced sudden and large snowmelt. These warm days were followed by major rainstorms that accelerated the melting and added to the water volume. As a result, several towns along the Red River were flooded. In Fargo, the water topped the levy, reaching a height of 44 feet, and flooded the area from the river to Interstate 29. The water was only two feet high in some places, but that was enough to cause major damage. Water and sewer systems were contaminated. Basements and first floors were flooded in some buildings, and electrical shorts in the upper floors caused some fires that the Fire Department, hindered by flooding, was unable to eliminate. Fifteen thousand homes, housing fifty thousand people, were flooded along with virtually all of Fargo's businesses, schools, hospitals, and clinics. Within hospitals, dialysis patients in particular suffered tremendously as water quality degraded.

It took two weeks for the water to subside but thankfully, there were no deaths. In Fargo, the flood warning had given the town a week to evacuate and FCPH led a huge and successful evacuation (particularly of the vulnerable in hospitals and nursing homes) with the support of local health departments, emergency medical services, bus companies, and local volunteers. Thanks to FCPH, vulnerable families and groups had thus been evacuated to safe areas prior to the actual flooding.

On a larger scale, however, the regional economy – which had already been challenged by the droughts from previous years – took a huge hit from the flood of 2020. Many businesses folded. Only 50% of Fargo families had previously purchased flood insurance, and many families struggled to restore their homes to habitable conditions. Property values and employment fell, along with city, county, and state revenues. Government layoffs were accompanied by private sector job loss, as the major regional employers suffered billions in damages and had to make staff cuts.

For years up to that point, funding for FCPH had been secure as long as the city was economically successful. However, in 2020, with the decline in city and county revenue, FCPH took the cuts along with all its fellow agencies. All non-mandated services and programs that did not have their own income stream (fees or federal funds) were eliminated. FCPH's Environmental Health Division stopped responding to nuisance complaints, focusing only on issues that presented imminent health risk or could affect the community's health. After the flood, inspections were required before businesses could reopen and before multiple unit housing could allow occupants to return. Mutual assistance compacts with other jurisdictions, as well as assistance from the Fire Department, helped the FCPH Environmental Health Division take on these tasks.

The summer of 2020 brought record heat, but rains as well. Many properties in the city remained unrepaired and unoccupied for several years, exacerbating mold, bacteria, and mosquito breeding. West Nile Virus became widespread among local and regional mosquitos, which infected many Fargo-Cass residents and caused several deaths. FCPH Environmental Health Division, the Public Information Officer, and the Health Protection and Promotion staffs worked hard with community partners to get residents and community groups to assist in the cleanup after the flood. However, some families were not able to return and their properties festered.

Even before the environmental issues plaguing Fargo escalated, health care reform had stalled by 2015. Many Fargo health care provider groups had worked hard to become effective medical homes, but access to health care grew more limited while demand for care grew. Besides challenges with access to care, more and more residents struggled with mental and behavioral health amidst the economic and environmental challenges. Nicotine use, for example, increased as patches, gum, and e-cigarettes provided a wider array of options to residents, particularly those suffering from depression. What's more, smoker coalitions and lobbying groups eventually "took their rights back," reversing smoking bans in Fargo and throughout the state.

As a result, the Family HealthCare Center continued to function as the safety net provider but was severely over-taxed. Poor and marginalized populations in Fargo suffered from declines in both health and health care access. FCPH had previously focused many of its maternal and child, women's, and elderly care programs on these populations. However, the federal government largely stopped its funding for these programs, and city and county cuts to FCPH in 2020 eliminated most of the remaining funding. Much of FCPH's prevention and health promotion activities thus halted. FCPH refocused some of its efforts on meeting the health needs of homeless and displaced persons. Many of them were flood refugees, and they struggled with an ever-increasing burden of chronic disease, depression, post-traumatic stress, and communicable diseases such as tuberculosis (both drug-resistant and multidrug-resistant), waterborne diseases, and vector-borne diseases.

By 2030, the health of the Fargo-Cass region had severely declined from the 2010s. Disparities in health and access to health care had grown, with environmentally displaced and low-income persons suffering

the most. Heart attacks, colds, and other associated side effects of tobacco use had increased as usage rates doubled to 25% of youth and 40% of adults by 2030. Severe funding cuts tied FCPH's hands in combatting these and other developments through prevention programs. Throughout the 2020s, FCPH has had to regularly release staff members and eliminate or curtail its public health activities and programs. In 2030, many are skeptical that Cass County and Fargo will ever be able to return to the levels of health seen just two decades earlier.

Scenario 3: Fit and Healthy Fargo

Scenario Overview

On both the national and local levels, the commitment to community prevention as the preferred tool for improving health grew. The private sector as well made significant changes in its practices in order to meet demands for health promotion and sustainability. Health care providers successfully lowered costs, provided great care, and improved population health. Fargo Cass Public Health (FCPH) capitalized on successful health care reform, technological advances, and growth of "common sense" policies to facilitate community engagement, promote community prevention and resilience, environmental sustainability, and the addressing of the social determinants of health. By 2030, FCPH achieved many of its community prevention goals.

Scenario Narrative

Public health was carried along in the 2010s by a growing bipartisan embrace of community prevention in the public and political spheres. In Fargo, and across cities, states, and within Congress, this converted previously controversial policy solutions into “common sense.” For example, the Farm Bill became the Food Bill, with a long-term vision that considered disease prevention, environmental sustainability, and the wellbeing of farming communities and workers. The U.S. Department of Agriculture (USDA), the U.S. Food and Drug Administration (FDA), and public health agencies (state and local) were charged with maintaining the safety of the food supply. Beyond food, “common sense” spurred widespread public and private investment in renewable energy, “complete streets,” parks, walking trails, and urban gardens throughout the 2010s and 2020s. Most American cities by 2030 had become easily and safely navigable without private ownership of cars.

Mirroring advances in policy and the public sector, the private sector also made significant changes in its practices in order to meet demands for health promotion and sustainability. Health care reform was implemented, and Accountable Care Organizations (ACOs) with integrated delivery and payment systems were established. ACOs successfully lowered costs, provided great care, and improved population health. The Sanford Health and Essentia Health healthcare systems and Family HealthCare Center (the leading community health center in the region) worked to improve population health. These health care providers joined FCPH and other community partners in improving community conditions and addressing the social determinants of health. Electronic health records (EHRs) became ubiquitous and interoperable, and in North Dakota they were stored or shared through a state-run cloud storage service that provided “big data” advanced analytics. FCPH could therefore conduct enhanced surveillance of infectious disease, chronic disease, and risk factors.

Community residents themselves also engaged with and contributed to big data. As smartphones became standard and affordable (even for low-income individuals and families), most citizens and residents gathered their personal biomonitoring data and became more skilled in learning from their information. Citizen science, led by consumer and patient groups, joined FCPH and health care providers in mining the data, mapping, and providing enhanced community needs assessments. Community

engagement processes, often facilitated by FCPH, helped many people to take part in setting health priorities for the community.

On both the national and local levels—whether in small rural communities, suburbs, or cities—the commitment to community prevention as the preferred tool for improving health grew. The intensity and specifics of this drive to enhance community prevention varied widely in the communities across the nation – but the direction was consistent. It represented a "mind change" toward health and shaping the determinants of health. For FCPH, this drive to enhance community prevention accelerated its move away from direct clinical services toward shaping policy, fostering community collaborations, and generally providing leadership for community health.

Community prevention activities also paralleled endeavors to ensure community resilience and health in light of the increasingly severe impacts of climate change in the region. Environmental sustainability thus became a core part of community prevention efforts. For example, in the early 2020s, FCPH began working with the state government to inspect industries and facilities for emissions in order to improve air quality. FCPH helped to establish smoke stack monitors and scrubbers, and advocated for policies for regulating and reducing emissions. FCPH also continued its inspection work of restaurants, swimming pools, body art businesses, pet stores, and other facilities that posed environmental health risks, though much of FCPH's work in this arena became automated or outsourced to private entities or well-trained neighborhood citizen science groups. Technology allowed greater automation in regulating and monitoring air quality, toxin concentrations, bacteria, moisture, critical temperatures, and carbon emissions. As video monitoring and its automated analysis became relatively inexpensive, inspections evolved into near-continuous monitoring. This data was aggregated into scores or ratings for individual restaurants or other regulated businesses. These scores were often included in consumer rating services such as Yelp! and Urban Spoon, and were updated in real-time so consumers could see current results of inspection and monitoring. FCPH provided quality assurance for the monitoring, ratings, and reporting.

FCPH collaborated with neighborhoods and community groups that focused on self-reliance and community resilience—as opposed to government dependency—in order to ensure local environmental sustainability, reduced emissions, improved community conditions, and quality monitoring. This collaboration with citizens and neighborhoods proved particularly useful for emergency preparedness. Emergency preparedness services evolved to foster "community health preparedness," i.e. creating healthier personal practices and conditions before emergencies. Strengthening communities prior to challenging events and emergencies allowed them to recover more quickly. Residents, community groups, businesses, and health care providers used simulations and gamification to anticipate and appropriately respond to any tornadoes, toxic spills, floods, or droughts that could occur.

Meanwhile, FCPH's nursing services continued to focus on providing personal contact and coaching for those most in need of it. Digital health coaches and personal electronic avatars became common. Almost all residents gained access to health care, and the local health care providers made sure that all their patients had these digital health coaches. The health care providers' practice management protocols considered the patient's health histories, as well as their indicators for the social determinants of health (including employment, access to healthy food, neighborhood safety, and physical activity). Each patient's digital health coach incorporated these practice management protocols into their advising. Nurses or community health workers continued to "visit" individuals electronically and in person as needed.

In addition to continuing its nursing services, FCPH continued to administer the city-owned homeless shelter. FCPH's health protection and promotion services joined forces with community and urban gardens that produced fresh food for the food shelters and food pantries, lowering the need for food assistance. Improved case management and referral to appropriate community services decreased the need for overflow shelter space and mental health services. FCPH also advocated for key policies supporting "complete streets" and other activity enhancing developments.

By 2030, FCPH had achieved many of its community prevention goals. It had capitalized on successful health care reform, technological advances, and "mind changes" and "common sense" that promoted community prevention and resilience, environmental sustainability, and the addressing of the social determinants of health. As a result, indoor and outdoor air quality had improved, and asthma incidence declined. Tobacco and e-cigarette bans expanded throughout the 2010s and 2020s, and by 2030 "common sense" policies and community prevention efforts had helped to reduce rates of nicotine use to less than 5% among youth and less than 10% among adults. When the Tobacco Settlement fund ended in 2025, the city and the state government provided some financial support for FCPH's tobacco cessation and prevention programs but permanent changes toward tobacco and nicotine control had already been established as a result of "common sense" policies. In 2030, FCPH continues to enjoy stable funding from local and state sources, and its staff has grown from 135 people to 160 by 2030.

Scenario 4: Healthy People, Healthy Communities

Scenario Overview

Health care providers, citizen science groups, and individual residents increasingly contributed to public health and the promotion of health equity in the region. In partnership with these groups and other agencies, Fargo Cass Public Health (FCPH) facilitated these and other endeavors in community health and prevention. This included promoting alternative economic activities to further support the health of marginalized and low-income populations. To prevent and mitigate the impact of climate change, FCPH also partnered with others to create, promote, and improve ecological and environmental health within FCPH programs and in the community. By 2030, community engagement, improved access to effective care, and enhanced community conditions have significantly improved health and health equity among residents.

Scenario Narrative

Fargo Cass Public Health (FCPH) and the Fargo-Cass region adapted well to the rapidly aging population and the impacts of climate change. Throughout the late 2010s, FCPH reduced its work in direct clinical services. FCPH still contributed a fair amount to patient navigation and case management, particularly for vulnerable populations like the mentally ill, the elderly, low-income individuals, the homeless, refugees, immigrants, and formerly incarcerated persons. FCPH's nurses became culturally and linguistically adept patient navigators. Case management was aided by FCPH's direct access to highly interoperable electronic health records (EHRs). Local health care providers routinely used EHRs, which were aggregated in cloud-based data systems. FCPH drew on ubiquitous EHRs to more quickly conduct surveillance tasks, as providers automatically provided alerts on reportable cases. With these tools, FCPH could pinpoint individuals, groups, and areas with the greatest need for case management.

After 2020, FCPH evolved further as health care providers, citizen science groups, and individual residents used health and mobile technologies, social media, and crowdsourcing to play greater roles in reporting, surveillance, monitoring, self-reporting, and self-monitoring. To take advantage of these technologies and information streams, and to more effectively enhance health and environmental assessment, FCPH actively worked with the most technologically adept segments of its population (i.e., students, recent graduates, and young and middle-aged employees). Many of them had taken a keen interest in community health, health equity, and environmental health.

The partnership between FCPH and these technologically savvy groups in surveillance, monitoring, self-reporting, and self-monitoring helped, for example, reduce nicotine and tobacco use. Combined with health promotion efforts, residents were more readily able to understand and support tobacco and nicotine control. In 2025, when the Tobacco Settlement funds ended, the city and the state government provided some additional funds to FCPH for tobacco cessation and prevention programs, but these were increasingly unnecessary as permanent reductions in tobacco and nicotine use were established.

These community-wide actions and policies against tobacco and nicotine reflected FCPH's larger efforts to shape community health determinants and policy. For analysis and targeting of community health needs, FCPH worked with private entities (which had become experts in big data management) and with citizen science groups (which had become adept at updating and crowdsourcing information in real time on various social media platforms). This helped FCPH keep on top of data analysis and information relevant to the region's health.

One major sector that impacted the region's health was that of agriculture. In the past, climate change had lengthened the growing season and had helped to foster great harvests. FCPH worked with employees on large farms to monitor conditions of the farms, crops, livestock, and produce, as well as the conditions of the surrounding environments and ecosystems. FCPH also helped to regulate emissions and agricultural runoff from the large farms. Throughout the 2010s, however, floods, tornadoes, droughts, and heat waves periodically hurt farms. Large farms in the area were the most resilient and achieved record breaking sales of their produce.

These extreme weather events also highlighted the economic, social, and health disparities between "typical" Fargo-Cass residents and the marginalized or at-risk populations, which included low-income and homeless people, the elderly, refugees, immigrants, "New Americans," and formerly incarcerated persons. During and after these extreme weather events, marginalized or at-risk populations were more vulnerable to heat-induced health problems and flooding in their neighborhoods, as well as challenges with getting to work (when they were employed), access to quality food, and increased water- and vector-borne diseases.

Leaders and advocates for and among these groups formed collaborations with Fargo-Cass residents, students from North Dakota State University (NDSU) and other schools, and FCPH. These collaborations sought to increase the use of open-access citizen science for enhancing the health of marginalized and vulnerable populations. For example, citizen science groups helped analyze environmental conditions in low-income neighborhoods, neighborhoods with large populations of immigrants, and various places of employment. Citizen scientists found that many employers placed employees from marginalized groups into areas or environments with high environmental health risks, without giving those employees proper protection or safety training. These and other revelations, backed by citizen science data and advocacy, helped spur movements to improve equity in the region.

The overall health of marginalized persons was also improved in other, more systematic ways throughout the 2020s. People with mental health issues received higher quality attention and treatment as health care organizations, health departments, and various government agencies integrated mental, behavioral, and physical health services (after some years of debate and lobbying),. This reorganization had been initiated when health providers began to move to integrated systems in the mid-2010s, and expanded their focus on improving community and population health. The expansion of "alternative economics" activities such as time banks, community-supported agriculture, and home-grown food further improved the health status of marginalized and low-income groups. FCPH's nursing program and its health protection and promotion services became heavily involved in coordinating and promoting these activities, and in monitoring the health of participants. By 2025, the Fargo-Cass region had also helped create nearly ubiquitous "complete streets", with green public transportation options, biking lanes, bike and car sharing programs, enhanced green spaces, and scenic walkways, all of which encouraged more physical activity. FCPH's Transport and Activity Facilitator (a position created in the early 2020s) played an active role in facilitating the development and use of these activities, in collaboration with FCPH's health protection and promotion services.

While these policies and activities sought to improve behavioral health, enhance community health, and reduce disparities, the extreme weather events (floods, tornadoes, heat waves, and droughts) continued to hit the area and call forth public health efforts throughout the 2020s. FCPH created the position of Sustainability Coordinator to address the increasing needs of environmental sustainability in the community and within FCPH units and programs. FCPH also created the Quality Improvement Officer position, focusing on improving effectiveness and cutting costs. The Sustainability Coordinator worked with the Quality Improvement Officer to ensure both organizational and environmental sustainability (including energy efficiency) within FCPH itself. Both looked to ensure the long-lasting impact of FCPH activities, while reducing environmental impact and energy use of FCPH and its programs. Environmental health shifted to and evolved within a new endeavor of "environmental improvement," and the Sustainability Coordinator was tasked with coordinating and leading environmental improvement in FCPH's prevention and promotion activities. As FCPH sought to create and promote human health, it worked in partnerships with other local and state agencies and community groups to create, promote, and improve ecological and environmental health within FCPH programs and in the community.

FCPH was able to refocus its resources on these endeavors because much of its monitoring and surveillance functions were automated or taken over by non-profit and commercial groups. Massive data was available from social media, mobile apps, environmental monitoring tools, biomonitoring devices, remotely piloted vehicles (RPVs), and digital health avatars. Companies and health care providers were adept at doing "big data analytics" on data from these sources. Video monitoring and its automated analysis became relatively inexpensive, and were linked to digital health avatars and emergency services. Inspections thus evolved into near-continuous monitoring. This data was aggregated into scores and ratings for individual restaurants or other regulated businesses. The results were often included in consumer rating services such as Yelp! and Urban Spoon, and were updated in real-time so consumers could see current results of inspection and monitoring, with personalized information/recommendations for each person based on their health profiles and goals. For example, a digital health avatar might analyze a user's genetic profile and recommend that he or she avoid eating at a certain restaurant because many of its dishes or its broth would cause adverse health impacts for that user.

FCPH also used emerging technologies to improve case management. For example, FCPH's nursing services found innovative ways to combine virtual care, telehealth, and in-person visits to optimize their case management for the elderly and the mentally ill. These patients benefited not only from in-person and tele-nurse visits, but also from having communities of relatives, neighbors, friends, and similar patients participating in the virtual hangouts, counseling, and therapy sessions.

While many of the elderly were benefitting from new technological practices for care, they wanted to lessen their burden to the health care system, their children, or their grandchildren. Baby Boomers across the nation sparked a movement to leave behind a positive legacy. They sought to reverse the projections that Millennials would be the first generation to do worse than its predecessors (in terms of life expectancy and financial wellbeing) because of the global and national social, economic, and environmental conditions that had dominated the 2000s and 2010s. The Fargo-Cass area was no exception. Members of the aging population actively sought to contribute to the health, environmental, and economic wellbeing of the locality, while remaining active themselves. Senior citizens in Fargo stepped up their roles in community gardening, local citizen engagement, citizen science, community design, and even environmental monitoring.

These active and engaged senior citizens often found themselves partnering with young students and professionals for research, monitoring, and local citizen engagement. Throughout the late 2010s and early 2020s, many candidates for and graduates of North Dakota State University's (NDSU's) Master of Public Health (MPH) program supported the movement to increase community and population health research. MPH students and graduates frequently worked with health care providers and producers of biomonitoring and environmental monitoring tools to conduct enhanced research. FCPH participated when possible, using this research to further its own efforts in prevention and health promotion. FCPH frequently reviewed the research of MPH students, as well as data from private providers, EHR systems, and tech companies (which provided biomonitoring tools and digital health avatars). This research and data was used as supplemental information relevant to FCPH's community health impact assessments.

By 2030, the health of Fargo-Cass residents, particularly that of the vulnerable population, has improved significantly. Community members have become so effectively engaged in their own health (and in that of their communities) that there is effectively less need for direct personal services from FCPH. FCPH facilitates endeavors in community health and prevention, and continues to enjoy relatively stable funding from local sources.

Scenario Matrix

The following pages offer a side-by-side comparison of the scenarios across multiple dimensions. Each column is consistent with but not solely duplicative of the respective scenario.

	Scenario #1	Scenario #2	Scenario #3	Scenario #4
THE MACRO AND OPERATING ENVIRONMENTS				
Economy	Slow national economic growth with two "normal" recessions. The Fargo-Cass region remains economically stable.	Local economic health till 2002, despite worsening national and state economic conditions. Devastating 2020 flood, severe droughts hurt Fargo's economy.	Steady economic recovery and slow growth nationally Fargo's economy is better than most local economies in the nation.	Strong economic recovery; living wage instituted nationally. Fargo's economy is relatively stable compared to the rest of the state and nation.
Climate Change, Environmental Threats/Impacts	Wetter fall, winter, and spring seasons; extended summers; and summer droughts in all scenarios			
	Several significant but not overwhelming floods. Three significant floods of at least 40 ft. between 2013 and 2030; sewer contaminations each time.	Severe summer droughts; A devastating 44' flood in 2020; the entire city is underwater for days; extensive sewer and infrastructure damage; region very slow to recover.	Periodic and significant flooding, heavier precipitation (rain, snow, and hail) during the winters. Sewer contaminations with highest floods.	Large farms periodically hurt by floods and severe storms; periodic significant flooding; heavier winter precipitation
Internet and Social Media	Specialized health and fitness networks, personal health/ biomonitoring, and Groupnets grow in use and influence. Divides in digital access have been reduced, but individuals newly gaining digital access are behind more acclimated users in using the tools effectively and finding reliable information.	Technological/digital access gaps exacerbate disparities; tools used more effectively by privileged persons. Online misinformation has serious consequences and leads to extreme levels of online conflict and polarization.	Ubiquitous and inexpensive intelligent devices; smart phones with subsidized minimum connection data packages reduce digital divide. Internet and social media are effectively used to determine truths, increase transparency and accountability, and promote inclusion.	Used effectively for reporting, surveillance, monitoring, self-reporting, self-monitoring, health, and health equity. Internet and social media are effectively used to determine truths, increase transparency and accountability, and promote inclusion.

	Scenario #1	Scenario #2	Scenario #3	Scenario #4
THE MACRO AND OPERATING ENVIRONMENTS				
Electronic Health Records (EHRs)	Used by all health care providers; updated regularly or in real-time; interoperable and accessible to FCPH for surveillance, monitoring and case management	High variability in use, quality, and scope of EHRs; state opt-in system lets patients "opt out" of sharing health data with public health agencies.	Interoperable, accessible, comprehensive, and ubiquitous EHRs; stored or shared through cloud service that provides "big data" analytics; public health access for enhancing surveillance.	Interoperable, accessible, comprehensive, and ubiquitous; public health access and use for case management and faster surveillance; contribute to "neighborhood health records."
Environmental Monitoring and Remote Sensing	Monitoring and sensing enhance Emergency Warning and Response Systems (EWRSs) and ensure quality in community initiatives, homesteading, and redevelopment. Remotely piloted vehicles enhance monitoring particularly during emergencies.	Quality, benefits, and use are highly unevenly distributed. FCPH usually cannot access data from non-governmental monitoring and sensing tools.	Ubiquitous and inexpensive, feeding into EWRS; automated, near-continuous monitoring and inspection data on emissions and safety publicly available. Inspections and much environmental monitoring automated and/or outsourced to for-profit, community and citizen science groups.	Ubiquitous and inexpensive, feeding into EWRSs and Environmental Improvement; data is publicly accessible. Extensive collaborations to conduct environmental monitoring and remote sensing.
Citizen science	Citizen scientists enhance community engagement and monitor and evaluate "complete streets", community gardens, homesteading activities, and development of previously unused lots.	Citizen science is most beneficial for and effectively conducted by the privileged; does not improve community conditions or health equity; poor quality assurance.	Well-trained citizen science groups conduct monitoring and aid in quality assurance of automated monitoring. Consumer/patient groups do data mapping, enhance community health needs assessments.	Expansive citizen science groups update and crowd source information in real time via social media; multiple layers of quality assurance. Open-access citizen science enhances health equity.
Mitigation, Adaptation, and Resilience Efforts	FCPH and its community partners use emerging technologies and social media to increase community preparedness and resilience and to enhance EWRSs.	2020 flood evacuation a major success, but little advance resilience effort. Capacity and success of mitigation & adaptation efforts constrained by significantly limited and reactive funding.	Environmental sustainability is a core tenet of community prevention efforts. Collaborations reduce emissions and complacency, foster resilience and preparation.	Sustainability Coordinator and Quality Improvement Officer address Environmental Improvement, sustainability, mitigation, adaptation, and community resilience within FCPH units and the community

	Scenario #1	Scenario #2	Scenario #3	Scenario #4
THE MACRO AND OPERATING ENVIRONMENTS				
Health Threats	New and re-emerging infectious diseases; extreme weather events; challenges to air, food, and water quality; and vector-, food-, and water-borne illnesses in all scenarios;			
	Some emergence of antibiotic-resistant bacteria. Oil and hazardous materials spills. 2020 Anhydrous ammonia disastrous spill.	Periodic national-scale pandemics; increasingly antibiotic-resistant bacteria; drug-resistant and multidrug-resistant tuberculosis. Sewer contamination in the flooding. Oil and hazardous materials spills; particularly difficult challenges with air, food, and water quality and illnesses; intense and frequent extreme weather events. Rising homelessness, displacement, marginalization, and unemployment.	Periodic emergence of antibiotic-resistant bacteria. Some bacterial and infectious disease issues associated with home food growing activities.	Periodic emergence of antibiotic-resistant bacteria. Some bacterial and infectious disease issues associated with home food growing activities
Health Care	Most residents have access to good health care through a medical home. Major local health providers and systems become ACOs – care is largely integrated.	Stalled health care reform; disparities in access grow, more un- and under-insured people. Over-taxed, overwhelmed, and understaffed Family HealthCare Center remains the safety net provider.	Nearly universal access to health care; health care providers (integrated) provide excellent care using technology and primary care teams and provide all their patients with digital health coaches.	ACOs become ACCs focusing on cross-sectoral approaches to community health and equity; PCMHs evolve into CCHHs. Health care merges mental and physical health.
Health Care Providers' Role in Population Health	Providers ensure that EHR data goes to FCPH to enhance surveillance of infectious and chronic disease patterns.	Limited population health activities; focus on patient panels and specific health conditions.	Providers enhance community practices, conditions, such as healthy foods, neighborhood and family safety, employment, as well as and emergency preparedness and awareness.	Providers support community prevention, link EHR data with FCPH's cloud service for auto-reporting.

	Scenario #1	Scenario #2	Scenario #3	Scenario #4
THE MACRO AND OPERATING ENVIRONMENTS				
Health Outcomes	Periodic increases in dengue, hay fever, asthma, allergies, heat- and air quality-related illnesses, and water-, vector-, and food-borne illnesses. Increased prevalence of cancers, mental and behavioral health problems, chronic diseases, and risk factors. Mixed progress on reduction of health disparities.	Rises in dengue, hay fever, asthma, nosocomial infections, allergies, heat- and air quality-related illnesses and deaths, malnourishment, and water-, vector-, and food-borne illnesses. Increases in injury, cancers, chronic disease, obesity, mental and behavioral health problems, depression, post-traumatic stress disorder, tuberculosis, and smoking. Health behaviors and disparities worsen.	Slight increases in heat- and air quality-related illnesses, and vector-, water-, and food-borne illnesses. Significant reductions in infectious disease, injury, violence, and chronic disease. Various bacterial and infectious disease issues associated with increase in home food growing and community gardening. Health disparities reduced.	Slight increases in heat- and air quality-related illnesses, and vector-, water-, and food-borne illnesses. Significant reductions in infectious disease, injury rate, and chronic disease; Various bacterial and infectious disease issues associated with increase in home food growing and community gardening. Significantly reduced health disparities.
FARGO CASS PUBLIC HEALTH (FCPH)				
FCPH Partners	Partners include UND, Family HealthCare Center, other health departments, and local groups to increase Fargo emergency preparedness and awareness, and to conduct enhanced surveillance, inspection, monitoring, analysis, and policy advising.	FCPH works with community partners to get residents and community groups to clean up after the flood, but it goes slowly.	FCPH works with community partners and providers to improve community practices and conditions; collaborates with community groups that focus on self-reliance and community resilience in order to ensure local environmental sustainability, reduced emissions, and improved monitoring and community conditions.	FCPH works with local and state agencies, community groups, MPH students and graduates, providers, private producers of biomonitoring and environmental monitoring tools, farming employees, and citizen scientists to conduct and enhance Environmental Improvement, open-access citizen science for health equity, research, prevention, and health promotion.

	Scenario #1	Scenario #2	Scenario #3	Scenario #4
FARGO CASS PUBLIC HEALTH (FCPH)				
Big Data & Big Data Analytics	FCPH uses big data and big data analytics, but not as quickly nor as effectively as the private sector and health care providers.	FCPH does not effectively use or analyze big data or implement big data analytics.	State-run cloud storage service that provides "big data" advanced analytics for EHR data.	FCPH works with more data-adept private entities to keep on top of data analysis and information relevant to the region's health.
Emergency Preparedness & Environmental Health	Services have expanded; coordinate with Public Information Officer to enhance emergency preparedness and awareness, monitoring, evaluation, EWRSs, and community engagement.	Emergency preparedness services suffer from erratic funding; environmental health services only focus on issues that present imminent health risk or that can affect the community's health.	Collaborations enhance emergency preparedness and awareness, foster Community Health, ensure environmental sustainability, emissions reductions, improved community conditions, and quality monitoring.	Services conduct Environmental Improvement efforts; collaborate with farms to monitor conditions and regulate emissions, agricultural runoff, crops, livestock, and produce.
Nursing	Has shifted from immunizations to assurance; works with case management for the most vulnerable and "new Americans."	Underfunded; overwhelmed with immunizations and case management.	Provides a "High Tech, High Touch" approach; ensures that digital health coaches and EHRs relate health history to social determinants and behavior.	Coordinates and promotes alternative economics activities, monitors participants' health; provides effective "High Tech, High Touch" care.
Health Protection and Promotion	Expands prevention activities; leads Metropolitan Food System Plan and stimulates community collaborations to map community conditions, develop available land into community gardens or safe physical activity spaces, increase neighborhood safety, and develop "complete streets".	Many prevention and health promotion activities are halted. Services focus on meeting the health needs of homeless and displaced persons.	Advocates for better health policy and collaborates on Community Health Preparedness, environmental sustainability, improving community conditions, monitoring; reinforce digital health coaches health promotion advice.	Helps Transport and Activity Facilitator coordinate and promote alternative economics activities, monitor participants' health, and develop "complete streets", green public transit, and green spaces. Ensures environmental improvement.

	Scenario #1	Scenario #2	Scenario #3	Scenario #4
FARGO CASS PUBLIC HEALTH (FCPH)				
FCPH Workforce ***(about 135 employees in 2013)***	~25% increase in staff, including some part-time employees. Better communications and analytics skills throughout the workforce. Those providing direct care migrated toward prevention, assurance and preparedness. Interdisciplinary teams more common, including interns from public health schools.	Staff reduced by 50%, including many part-time staff.	~20% increase in staff, including several paid interns and part-time employees. Interdisciplinary teams more common, including interns from public health schools.	~20% increase in staff, including several paid interns and part-time employees. Interdisciplinary teams more common, including interns from public health schools.
FCPH Funding	Funding remains very stable, from Fargo, the County and West Fargo.	Funding has declined sharply since the 2020 flood.	Stable local and state funding; more flexible federal funding.	Stable local and state funding; flexible federal funding.