State of Tennessee

2015 Edition of the

State Health Plan

Division of Health Planning
Tennessee Department of Health

TN Department of Health

TN Department of Health

2015 Edition of the State Health Plan

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Introduction

Foreword

Today our nation is facing a health crisis caused by related epidemics of chronic disease—preventable epidemics enabled by the places, spaces, and relationships that shape our choices and that can challenge our health on a daily basis. Underlying this crisis are what we in the Tennessee Department of Health (TDH) call the "Big Three plus One": physical inactivity, excessive caloric intake, and tobacco and nicotine addiction, plus other substance use disorders. Taken together these Big Three plus One issues are driving all 10 of our 10 leading causes of death in Tennessee and in our nation. They are taking years from our lives and life from our years. Importantly, the Big Three plus One are not separate and distinct challenges; they are closely connected, each delighting our ancient dopaminergic reward system, the wiring for our very survival embedded deeply in our brains. In other words, the temptations of the “Big Three plus One” can be tangled together and magnified by our very nature as human beings. They can drive us to seek them out because they satisfy deeply felt needs and can make us happy, or seem to, at least for a while.

As a nation we are coming to realize that merely doubling down on health care spending, most of which is actually spent on sick care, doesn't work. The truth is, we cannot spend, regulate, or treat our way out of our current health crisis. We can, however, prevent our way out of it by blocking disease before it starts by thinking and acting upstream through primary prevention.

Primary prevention has always been the critical value multiplier of the health enterprise. It is where most of our substantial gains in years of life and life in years have occurred. Consider, for instance, the issue of safe drinking water, a prime “upstream” example. Primary prevention is how those of us in the health enterprise, as engaged as we may be in providing direct services, most effectively leverage our work and resources. It is also how we, as individuals, as members of a family, can get the greatest purchase on a longer, freer, more fulfilling life course. This is the core of true population health: giving people the greatest opportunity to fulfill all their lives have to offer, limiting the need for health care services throughout their lives. This doesn't mean access to health care is not important. It is essential, sometimes even critical, at various points in our life’s course. Yet, the diseases compounding our health crisis, which are themselves driven by the Big Three plus One behaviors, generally can't be cured by health care. The health care enterprise can only identify the resulting health problem (secondary prevention) or lessen its adverse consequences (tertiary prevention).

When we ask ourselves what we, the people, really want from our health care enterprise, it is not access to health care, it is simply health. Don’t the vast majority of us really just want to be healthy, to have and to hold the most optimal health possible for us? How many of us, given the

choice, would rather be anywhere other than inside an MRI scanner, or in an urgent care clinic, or in a hospital? Most of us would trade a park for a waiting room any day. If we as a society and health enterprise really want health equity and optimal health for all, then we must admit that health care (which embodies both secondary and tertiary prevention) must not be either the beginning or an end in itself. Our end is not a single life saved or improved, as gratifying and celebrated as that may be, but measurable improvements in the health of the whole population and of future generations. But that is not our society's emphasis today. We spend less on preventive efforts and research directed at primary prevention than we do on many a drug class on the market today. Moreover, we know that the places and spaces where we live and the choices we make with the people in them can impact our health more than our genes, more than our income, and more than our access to health care, yet when it comes to improving health outcomes our focus tends to remain narrowly placed on health care. That's why we need to move schools, communities, businesses, local governments, faith communities, and non-governmental organizations to create the conditions and expectations in our culture that support the primary, upstream prevention of disease.

A New Framework for the State Health Plan

From the very first edition produced in 2009, the Tennessee State Health Plan and its accompanying processes have served as a helpful vehicle to align ideas, resources, and people around the Five Principles to Achieve Better Health: Healthy Lives, Access to Health Care, Economic Efficiencies, Quality of Care, and Health Care Workforce. Subsequent updates to the State Health Plan have recognized the need to broaden our focus from health care to health, considering linkages to all of the things that shape and influence health. While these principles remain important and will continue to guide our evaluation of Tennessee's health enterprise, we must recognize that what we truly need to move our thoughts and actions further upstream is a framework, a way to consider the connections between the places, spaces, and relationships that shape our choices and the levers available to us in each of these domains that move us in the right direction.

The framework put forward in this edition of the State Health Plan is just that—a framework. Our hope is that it will serve as the skeletal structure to support the ongoing work that is implementing, testing, promoting, planning, and reaching for improved health outcomes, all in a way that is useful and accessible to those in the best position to influence health, whether or not they are part of the traditional health enterprise. This framework allows everyone from city planners and educators to businesses and health care providers to see how they fit into the *population health improvement enterprise* as well as how improved health will help them better address their core challenges, be that recruiting jobs or educating students.

Building a Strong Foundation

We are building this new framework on a strong foundation. Despite the challenges in our way, the momentum in Tennessee is clearly moving us towards opportunities for health equity and for optimal health for all thanks to the work of many partners from many sectors. We are grateful for

the partnership of thousands of organizations and residents whose growing concern for the health of our population is leading them to think differently. One of the partners we are proud to engage in thinking differently is TennCare, Tennessee's Medicaid program. TennCare is leading Governor Haslam's initiative to rethink how we pay for health care so that the value of care, not just the volume of care, assumes greater importance. As part of this work, TennCare received funding from the U.S. Center for Medicare and Medicaid Innovation through the State Innovation Model (SIM) Initiative. An emphasis of SIM is improving population health, and TDH is grateful for the opportunity to support TennCare's SIM efforts by developing this edition of the State Health Plan.

To develop this edition, TDH also partnered with five of Tennessee's public health academic training programs, each of which developed a regional population health improvement plan on a priority topic. We are very thankful to everyone who participated in the development of these regional plans, particularly the faculty and students who pored over evidence and data and engaged their communities through interviews and public meetings, all to develop a set of recommendations we now consider at the state level through our new framework.

Conclusion

The health challenge of our time—combating the Big Three plus One—requires new thinking to address these drivers of chronic disease, disability, and early death at their roots. A framework helps our thinking by giving us common language and tools that everyone can use to collaborate and share. As we learn and do more, the framework fills in with accomplishments and success stories, not to mention things we learned did not work as intended. Altogether, this shared knowledge—which leads to shared purpose—is exactly what we need to build a culture of health in Tennessee, one where the healthy choice becomes the normal choice. We hope that by asking three simple questions—

1. Are we creating and improving opportunities for optimal health for all?
2. Are we moving upstream to prevent disease?
3. Are we learning from and teaching others?

—we can get everyone in Tennessee working from the same blueprint. When combined with the State Health Plan's repository of best practices, data summaries, goals, and recommendations, we will have a sturdy framework to support the ongoing work of making Tennessee the healthiest state it can be.

John J. Dreyzehner, MD, MPH, FACOEM
Tennessee Commissioner of Health

Executive Summary

The 2015 Edition of the State Health Plan continues to support the mission of the Tennessee Department of Health (TDH), "to protect, promote, and improve the health and prosperity of people in Tennessee", by leveraging the Centers for Medicare & Medicaid Services (CMS) State Innovation Model (SIM) Grant to develop a State Population Health Improvement Plan.

Balancing Health and Health Care

In the spring of 2015 the Tennessee Division of Health Care Finance and Administration (HCFA), which includes the Bureau of TennCare and the Strategic Planning and Innovation Group, received the CMS SIM Round Two Test Award, the purpose of which is to improve health system performance, increase quality of care, and decrease costs for all residents of participating states.[1] The SIM award continues the work that was started in 2013 when Governor Bill Haslam launched Tennessee's Health Care Innovation Initiative, an effort to change the way health care is paid for in the state.

The Plan for Improving Population Health

In addition to supporting innovative health care delivery and payment models, the SIM award requires the development of a Plan for Improving Population Health. This provides an opportunity to begin to bridge the gap between population health and health care. By creating plans that improve population health in tandem with changing the health care payment system to incentivize efficient and effective treatment, Tennessee will make significant progress toward the goal of improving health for all.

The Plan for Improving Population Health builds on the importance of health protection and primary prevention identified in the 2014 Edition of the State Health Plan, while elevating that work by creating a detailed, actionable plan to improve population health across the state. The Plan was developed through a partnership with five academic public health in Tennessee, each of whom developed regional population health improvement plans for one of five health areas in which Tennessee struggles: perinatal health, child health, tobacco use, diabetes and obesity. These schools engaged in regional, grassroots, community-focused campaigns, coupled with statistical analysis, to identify the key factors causing these health problems and also developed recommendations for how to improve health in these areas. This work, conducted under the SIM process to develop a Plan for Improving Population Health, provides the majority of the content of the 2015 Edition of the State Health Plan.

Upgrading the State Health Plan

The 2015 Edition of the State Health Plan features key changes to the traditional framework of the State Health Plan. The Plan shifts away from using the Five Principles for Achieving Better Health and instead uses three guiding questions to outline the overall themes and key factors to consider

[1] For more information on the Centers for Medicare & Medicaid Services' State Innovation Models Initiative, visit: https://innovation.cms.gov/initiatives/state-innovations/

when thinking about health in Tennessee. These questions are focused on moving towards primary prevention, using evidence-based approaches when available, and approaching health through a broader lens.

State Health Plan's Guiding Questions:

1. Are we creating and improving opportunities for optimal health for all?
2. Are we moving upstream?
3. Are we learning from or teaching others?

Additionally, the State Health Plan includes a repository of actionable recommendations and opportunities for how stakeholders at all levels can improve health in the five key health areas: perinatal health, child health, tobacco use, diabetes and obesity. Subsequent updates to the State Health Plan will continue to render this repository more robust. The repository also includes mental and behavioral health recommendations and opportunities as they pertain to the five health areas.

These updates are an effort to improve the usability and relevance of the State Health Plan to health stakeholders at all levels, from consumers, to providers, to policymakers. The 2015 Edition of the State Health Plan is the first step in developing this initial framework, which will continue to be refined through subsequent updates.

Purpose of the State Health Plan

The State Health Plan offers a blueprint for improving the health of people in Tennessee. Since 2009 the Division of Health Planning has developed several editions and updates, bringing together hundreds of stakeholders in the process. More important than any document is the process used to 1) develop, 2) execute, 3) evaluate, and 4) adapt the plan. As part of the Division's ongoing evaluation of the planning process and its efforts towards process improvement, the Division determined that a new framework could provide a stronger platform to think about and build upon the challenges and opportunities facing Tennessee. This framework is meant to improve the usability of the State Health Plan at all levels, from businesses to state policymakers, and to be an actionable, flexible structure that can help support the tremendous work underway across Tennessee.

The purpose of the 2015 Edition of the State Health Plan is not to provide a final answer on all population health improvement goals and objectives—it is meant to offer a philosophy that can help align stakeholders towards efforts that yield the greatest value for health. This philosophy, one geared towards the upstream prevention of disease and injury, can certainly help inform many of those goals and objectives, but even more so it can help all people in Tennessee to think about the decisions, behaviors, policies, and investments that are best suited to improving the health of Tennessee's population.

Evolution of the State Health Plan

Recognizing the need for the state to coordinate its efforts to improve the health of the people of Tennessee, the General Assembly passed Public Chapter 942 in 2004. This act created the Division of Health Planning, which was charged with developing a State Health Plan. The Public Chapter required the State Health Plan to be annually approved and adopted by the Governor. The law states that the State Health Plan:

- "Shall include clear statements of goals, objectives, criteria and standards to guide the development of health care programs administered or funded by the state of Tennessee through its departments, agencies or programs;"
- Is to be considered "as guidance by the Health Services and Development Agency when issuing certificates of need;"
- "Shall guide the state in the development of health care programs and policies in the allocation of health care resources in the state".

2009 and 2010 Editions

The first edition of the State Health Plan was developed and published in 2009. This document served as the beginning of a comprehensive and participatory health planning process aimed at coordinating efforts to improve the health of the people in Tennessee. The 2010 edition of the State Health Plan was the result of an extensive public process comprised of regional public meetings and collaborative efforts that gathered the input of many stakeholders, health experts, and the people of Tennessee. That edition, for the first time, adopted Five Principles for Achieving Better Health that have served as the Framework for the State Health Plan. The Five Principles, drawn from policy set forth in Tennessee law are as follows.[2]

1. **Healthy Lives:** The purpose of the State Health Plan is to improve the health of the people in Tennessee.
2. **Access:** People in Tennessee should have access to health care and the conditions to achieve optimal health.
3. **Economic Efficiencies:** Health resources in Tennessee, including health care, should be developed to address the health of people in Tennessee while encouraging value and economic efficiencies.
4. **Quality of Care:** People in Tennessee should have confidence that the quality of care is continually monitored and standards are adhered to by providers.
5. **Workforce:** The state should support the development, recruitment, and retention of a sufficient and quality health workforce.

The 2010 edition also outlined key determinants of health and developed the first set of Goals for Achieving Better Health. Subsequent editions identified key strategies for improving the health of

[2] Tennessee Code Annotated § 68-11-1625(b), see Appendix A.

the people of Tennessee and reported on the ongoing status of specific health outcomes and determinants.

2014 Edition and Its Ongoing Impact

The 2014 Edition of the State Health Plan retained the Five Principles for Achieving Better Health Framework, but expanded the principles to promote an emphasis on health protection and primary prevention. In this edition, "health protection and promotion" was identified as the best way to accelerate improvements in population health while still recognizing the role health care plays in improving individual health.

During the development of this Plan, an analysis of Tennessee's health rankings and measures resulted in the understanding that four behavioral factors greatly impact a majority of the causes of excessive deaths in the state. These four behaviors include smoking, obesity, physical inactivity, and substance abuse. Labeled the "**Big Three plus One**", these factors became the target of department-wide primary prevention initiatives[3] and a focal point for departmental interactions with community partners and other state departments. At the time of publishing the 2015 Edition, the Big Three plus One directly influenced at least six of the top ten leading causes of death in Tennessee, and also directly influenced other public health threats in the state such as heart disease, cancer, and diabetes.

The 2014 Plan made significant revisions to the Goals set forth in the 2010 Plan and, for the first time, identified an initial set of SMART[4] Objectives for improving the health of the people of the state. The Goals were revised to be aspirational in nature, aiming for an ideal state of health in Tennessee. This provided an opportunity for more innovation and creativity in developing the new Objectives for 2015. The Objectives were based on TDH's strategic planning initiatives and were vetted through an extensive public process. That process engaged industry stakeholders and the public in order to gain knowledge from professional expertise and shared personal experiences. These Objectives emphasized primary prevention initiatives that focused on healthy weight and nutrition, tobacco use prevention, infant mortality, immunizations, substance abuse, and unintended pregnancies. Each Goal and Objective of this State Health Plan was organized under the Principle for Achieving Better Health that it supported.

The 2015 Edition of the State Health Plan continues to support the mission of TDH, "to protect, promote, and improve the health and prosperity of people in Tennessee", by utilizing a Centers for Medicare & Medicaid Services State Innovation Model award to enhance the depth of consideration into five key health areas. This Plan also re-emphasizes the importance of health protection and primary prevention identified in the 2014 Edition of the State Health Plan, while

[3] According to the Centers for Disease Control and Prevention, primary prevention is designed to prevent a disease or condition from occurring in the first place. The Primary Prevention Initiative was established by the TDH Commissioner Dr. Dreyzehner in 2012. The goal is to focus the Department's energy on primary prevention. For more information visit: https://tn.gov/health/topic/fhw-ppi

[4] SMART: Specific, Measurable, Attainable, Relevant, and Time-Bound

adding to previous work by developing a plan to improve population health across the state.

Certificate of Need & the State Health Plan

Tennessee's Certificate of Need (CON) program seeks to deliver improvements in access, quality, and cost effectiveness through orderly growth management of the state's health care system. In accordance with Tennessee law, the annual updates to the State Health Plan contain revisions to specific CON Standards and Criteria that are used by the Health Services Development Agency (HSDA) as guidelines when issuing CONs. Revising the Standards provides an opportunity to ensure the guidance provided to the HSDA reflects the modern needs of Tennessee's health care system. This edition contains updates to the Standards and Criteria for Psychiatric Inpatient Services and Neonatal Intensive Care Units.[5]

[5] For more information, see the section titled Certificate of Need Standards.

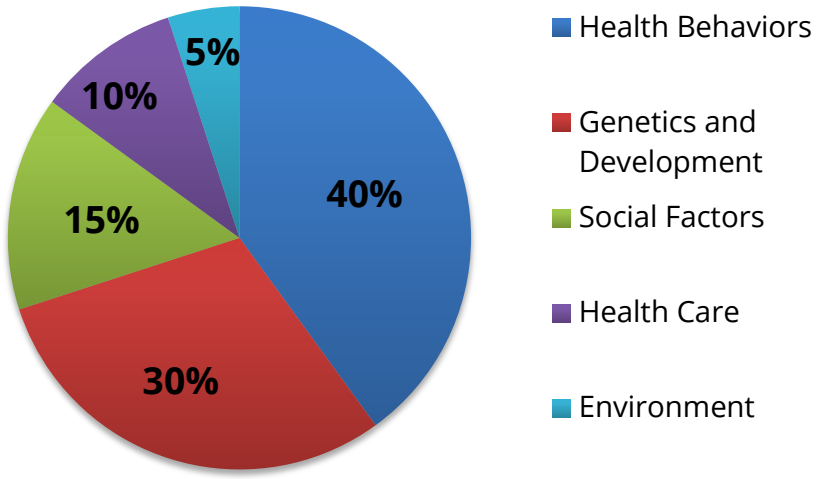
Importance of Population Health

The State Health Plan serves as an overarching policy document for the state that supports the mission of TDH to "protect, promote, and improve the health and prosperity of people in Tennessee". In order to advance this mission, the 2014 Edition of the State Health Plan shifted from a focus on health care to a focus on population health.

In support of this shift, the 2014 edition utilized a new definition of health. This definition recognizes that every individual has a state of "optimal health" which allows him or her to live a high-quality life free of preventable disease, preventable disability, and preventable injury.

While health care plays a crucial role in the lives of individuals, it generally fixes a problem, or prevents it from getting worse, rather than preventing a health concern from occurring in the first place. Numerous factors outside of health care contribute to population health status, including behaviors, culture, the environment, economic and social determinants, and genetics. When efforts shift from a primary emphasis on improving health care to addressing population health and primary prevention initiatives, an opportunity arises to prevent numerous health concerns from ever taking place.

Figure 1 – What Impacts our Health?



Sources: McGinnis JM & Foege WH. Actual causes of death in the United States. JAMA 4993: 270(18):2207-12 (Nov. 10) McGinnis JM, Williams-Russo P, & Kinckman JR. The case for more active policy attention to health promotion. Health Affairs 2002: 21(2):78-93 (Mar).

As shown in Figure 1, behaviors and choices have the most influence on our health, while health care only affects 10 percent of our health and longevity, and 30 percent is affected by genetics, over which we have little or no influence. In order to more effectively move the needle on the health status of the people in Tennessee, the State Health Plan is continuing to emphasize population health as a means of effecting change in the numerous influencers on health that fall outside of health care. Population health encompasses the remaining influences (social factors, health behaviors, and environment) that significantly impact health and longevity.

Population health is defined as "the health outcomes of a group of individuals, including the distribution of such outcomes within the group". Included in this definition are health outcomes, patterns of health determinants, and policies and interventions that serve to form links between outcomes and determinants.[6] In order to successfully improve health outcomes the Plan is working to address the underlying health determinants as a method of prevention. This emphasis on population health provides a broader approach for improving health. By not limiting the breadth of the State Health Plan to health care, the Plan may influence many factors that significantly impact the health of the people of the state. Population health provides TDH with an opportunity to take new, unique, and innovative approaches to increase the ability of all Tennesseans to achieve a state of optimal health. These approaches include access to healthy foods, the built environment (i.e., sidewalks, safe parks, and greenways), and empowering local groups to affect change within their communities.

In addition to aiding Tennesseans in reaching a state of optimal health, a focus on population health and prevention can actively serve as a cost-saving mechanism. Decreases in health care spending related to the treatment of chronic diseases can be expected as efforts shift toward effective, evidence-based[7] prevention initiatives. For more information on the cost savings associated with primary prevention, see the section titled Are We Moving Upstream?

The Plan's promotion of prevention will move TDH efforts upstream with the expected impact being improved optimal health among the people of the state, a decrease in costs associated with treatment of preventable chronic diseases, and a decrease in lost wages associated with poor health outcomes. This impact will be accomplished by promoting the use of evidence-based programs,[8] while still encouraging the innovative work being done by various state and local groups.

[6] David Kindig, MD, PhD and Greg Stoddart, PhD, Am J Public Health. 2003 March; 93(3): 380–383.

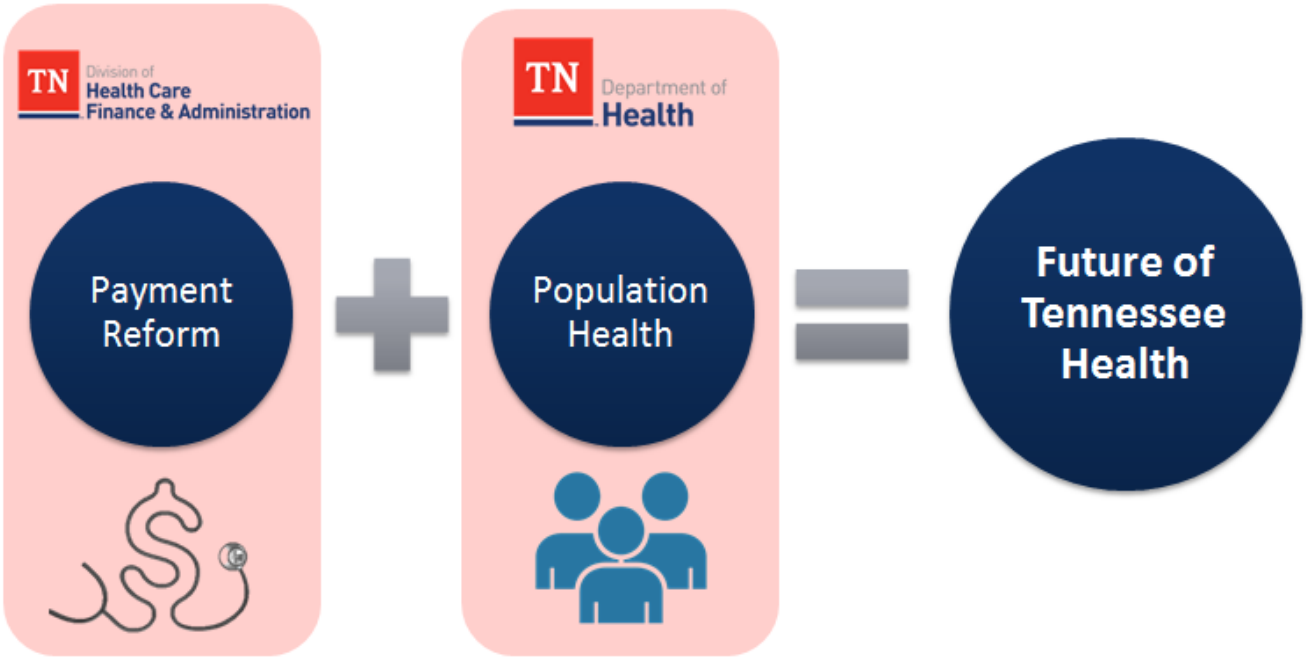
7 Evidence-based programs utilize statistical evidence coupled with clinical expertise to develop recommendations on how to approach a specific health issue. For more information, see the section titled Are We Learning From or Teaching Others?

[8] For more information on this effort see the section titled Are We Learning From or Teaching Others?

Bridging the Health Care Gap

While the State Health Plan is continuing to emphasize the importance of population health, the TDH is working closely with the Bureau of TennCare, an office within the Division of Health Care Finance and Administration of the Tennessee Department of Finance and Administration, to bridge the gap between population health and health care. As a way to bridge this gap, Governor Bill Haslam launched Tennessee's Health Care Innovation Initiative in 2013, which focuses on changing the way health care is paid for in the state.

Figure 2 – Cross-Agency Collaboration



Three strategies, primary care transformation, episodes of care, and long-term services and supports, are being utilized to incentivize health care providers to provide high quality and efficient treatment while also managing people's health over time.

- **Primary care transformation** focuses on the role of the primary care provider in promoting the delivery of preventive services and managing chronic illnesses over time. The Initiative is developing an aligned model for multi-payer Patient Centered Medical Homes (PCMH), Tennessee Health Links for TennCare members with Serious and Persistent Mental Illness, as well as a shared care coordination tool that includes hospital and Emergency Department admission, discharge, and transfer alerts for attributed providers.

- **Episodes of care** focus on the health care delivered in association with acute health care events such as a surgical procedure or an inpatient hospitalization. Episodes encompass care delivered by multiple providers in relation to a specific health care event.

- **The long-term services and supports (LTSS)** component focuses on improving quality and shifting payment to outcomes-based measures for the QuILTSS (Quality Improvement in Long Term Services and Supports) program and for enhanced respiratory care.

Source: Tennessee Division of Health Care Finance & Administration:
https://www.tn.gov/hcfa/section/strategic-planning-and-innovation-group

Together, these efforts will shape the future of health for the people in the state. By creating plans that improve population health, while also changing the health care payment system to reward high quality and efficient medical treatment, Tennessee will be making serious progress toward the goal of all citizens acheiving a state of optimal health.

State Health Plan

A New, Initial Framework

The 2015 Edition of the State Health Plan introduces novel changes to the past framework of the State Health Plan. These initial updates are an effort to improve the usability and relevance of the State Health Plan to stakeholders at all levels, so that any individual or organization at any level of health or health care can find value in the Plan. This framework will continue to be refined in further updates.

The State Health Plan is intended to easily and clearly guide the development of new legislation, policies, programs, and community planning initiatives. It lays the path for how different groups may successfully improve population health and provides an easily accessible repository of actionable opportunities and recommendations for different groups that can affect change. The State Health Plan is a living document, which is updated regularly to maintain relevance and accuracy. The Plan also provides a way to acknowledge stakeholder contributions to the health of the community.

The State Health Plan provides a mechanism for any individual, group, or organization to align with the overall direction of the state, to find new opportunities and approaches for addressing health problems in their communities, and to connect with partners and revenue streams to work with to accomplish their community health goals.

Guiding Questions

Since 2010, the State Health Plan has centered around the Five Principles for Achieving Public Health set forth in Tennessee Code Annotated § 68-11-1625(b).[9] Beginning in 2016 and moving forward, the State Health Plan will instead use three guiding questions to outline the overall themes and key factors to consider when thinking about health in Tennessee.

These questions will serve as a set of guiding statements that reflect the overall direction of the policies and programs instituted by TDH and its partners in its mission to "promote, protect, and improve the health and prosperity of people in Tennessee". By answering these questions, an individual, group, or organization may determine if they are aligned with the overall direction of the state and its approach to improving population health. These questions are intended to be broad enough to be applicable to all stakeholders while providing specific direction at all levels of health and health care. They can be used easily by anyone from community volunteers to health policy experts.

The Three Guiding Questions of the State Health Plan are as follows:

Figure 3 – Guiding Questions of the State Health Plan

[9] The Statutory Authority for the State Health Plan is outlined in Appendix A of this document, and includes the text that defines the Five Principles for Achieving Public Health.

Are We Creating and Improving Opportunities for Optimal Health?

Optimal health is a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity.[10] In order to help each individual in the state achieve optimal health, it is important that policies, programs, and interventions focus on improving health on a broader scale. It is beneficial for initiatives to move beyond the boundaries of traditional health care and seek to improve population health outcomes, diminish health disparities, and address social determinants of health.

> **Social Determinants of Health** are the conditions in which people are born, grow, live, work, and age. These circumstances are shaped by the distribution of money, power, and resources at global, national, and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries, states, or other populations.

Source: World Health Organization, http://www.who.int/social_determinants/sdh_definition/en/

Enlarging the scope of what is considered to affect health gives ample opportunity to engage non-traditional stakeholders as well. Focusing on optimal health for Tennesseans could include investing in social services, transportation infrastructure, food access, or environmental development projects. These investments are in addition to those typically interpreted to be focused on health, such as providing services or improving access to care. An inclusive approach to improving health requires utilizing all venues available to provide more effective means to elevate the individual, and consequently the population, to a state of optimal health. These tools can be used to prevent chronic disease, design healthy communities, create social, mental, and emotional support structures, and minimize barriers for individuals to reach optimal health.

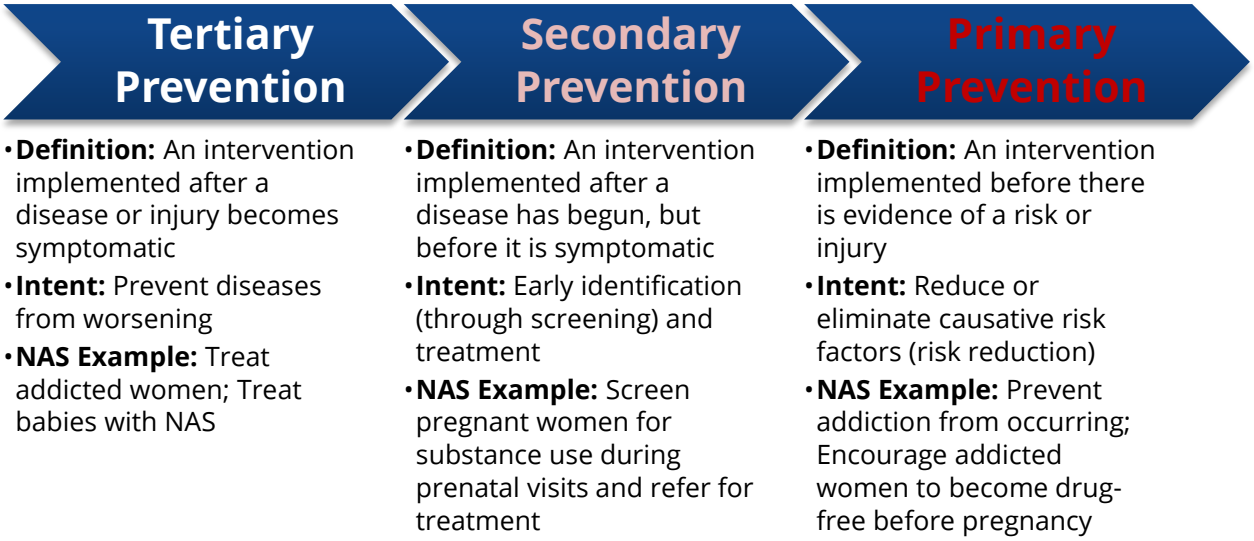
[10] Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.

Are We Moving Upstream?

What if instead of treating an issue or illness, it could be prevented from occurring in the first place? That is the idea behind primary prevention.

Figure 4 outlines the differences between the three main levels of prevention, using examples related to Neonatal Abstinence Syndrome (NAS).[11] In moving along the spectrum from tertiary prevention to primary prevention, greater efforts are focused on preventing diseases and health issues from developing. This shift to primary prevention is accomplished by addressing root causes as opposed to focusing solely on treating symptoms of a greater problem.

Figure 4 – The Levels of Prevention



Source: Adapted from: Centers for Disease Control and Prevention. A Framework for Assessing the Effectiveness of Disease and Injury Prevention. MMWR. 1992; 41(RR-3); 001.
Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/00016403.htm

In addition to improving health, prevention is also a cost-saving mechanism. By focusing efforts on lower-cost preventive measures, the health enterprise can decrease the amount it spends on treating chronic disease. For example, in 2010, the Centers for Disease Control and Prevention (CDC) launched Communities Putting Prevention to Work (CPPW), a $485 million program to reduce obesity, tobacco use, and exposure to secondhand smoke. CPPW communities implemented evidence-based policy, systems, and environmental changes in an attempt to sustain reductions in the risk factors of chronic disease. Examples of the interventions used include policies requiring daily physical education for middle and high school students, health

[11] According to the National Library of Medicine, Neonatal abstinence syndrome (NAS) is a group of problems that occur in a newborn who was exposed to addictive opiate drugs while in the mother's womb.

food and beverage policies at county departments, and hospitals adopting tobacco-free campuses. Sustained CPPW improvements are expected to avert 14,000 premature deaths, $2.4 billion (in 2010 dollars) in discounted direct medical costs, and $9.5 billion (in 2010 dollars) in discounted lifetime and annual productivity losses through 2020. Simulation modeling using the Prevention Impact Simulation Model (PRISM)[12] tool suggests that large investments in community preventive interventions, if sustained, could yield cost savings many times greater than the original investment over 10 to 20 years and avert 14,000 premature deaths.[13] This evidence shows that a prevention-first approach not only saves money, but can save lives.

The need for tertiary prevention as a method of treatment will never fully be eliminated. However, as risk factors that cause chronic illnesses and other health issues are successfully addressed, the likelihood that people develop these chronic illnesses and other health issues will decrease. In the development of future policies, programs, and initiatives, efforts should be made to move further upstream along the continuum of treatment and continue to progress towards a primary prevention focus.

[12] PRISM (Prevention Impacts Simulation Model) is a web-based tool that helps users make informed chronic disease intervention decisions by modeling the likely impact of intervention strategies on a population's health. Its creation was funded by the Centers for Disease Control and Prevention beginning in 2007.

[13] Soler R, Orenstein D, Honeycutt A, Bradley C, Trogdon J, Kent CK, et al. Community-Based Interventions to Decrease Obesity and Tobacco Exposure and Reduce Health Care Costs: Outcome Estimates From Communities Putting Prevention to Work for 2010–2020. Prev Chronic Dis 2016;13:150272. DOI: http://dx.doi.org/10.5888/pcd13.150272.

Are We Learning From or Teaching Others?

It is important to ensure that investments made in the health of people actually create significant change. Evaluation is necessary to know if policies, programs, and interventions are truly effective in improving health. This evaluation can include gathering quantitative and qualitative data, and analyzing that data to find observable improvements that can be attributed to specific policies, programs, and interventions. Evaluation is especially important for innovation. Developing new and unique approaches to existing health problems is often integral to advancement. By evaluating these new programs, other communities have the opportunity to learn from these new and innovative approaches.

The use of evidence-based programs that have been proven successful in other areas of the state or country is encouraged. Evidence-based programs utilize statistical evidence coupled with clinical expertise to develop recommendations on how to approach a specific health issue.[14] Using evidence-based approaches limits the need to reinvent the wheel by instead learning from national experts or peers in similar communities tackling comparable health issues.

There are many successful evidence-based initiatives already being implemented around the state like BABY & ME - Tobacco Free[15], which has been shown to improve quit rates for mothers who smoke during pregnancy. For local recommendations that are tailored to improving the health of people in Tennessee, the State Health Plan is available, offering state-specific opportunities and recommendations.[16] Additionally, local health departments, providers, schools, businesses and communities can provide guidance and resources on what has worked in different areas of the state. Evidenced-based programs and best practice recommendations are available through published academic and professional journals, as well as national outlets such as the Centers for Disease Control and Prevention[17], American Heart Association[18], National Association of County & City Health Officials[19], United States Public Health Service Task Force[20], and other similar groups.

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[14] Titler MG. The Evidence for Evidence-Based Practice Implementation. In: Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008 Apr. Chapter 7.Available from: http://www.ncbi.nlm.nih.gov/books/NBK2659/

[15] BABY & ME – Tobacco Free is an incentives-based smoking cessation program targeted towards reducing smoking among pregnant and post-partem women by providing vouchers for diapers to those who prove to be smoke-free. For more information, visit: http://www.babyandmetobaccofree.org/

[16] For state-specific opportunities and recommendations, see the section titled State Plan for Improving Population Health and Appendix D.

[17] Access the Centers for Disease Control and Prevention's Recommendations, Best Practices, and Guidelines for Chronic Disease Prevention and Health Promotion here: http://www.cdc.gov/chronicdisease/resources/guidelines.htm

[18] Access the American Heart Association's Best Practice Center here: http://www.heart.org/HEARTORG/HealthcareResearch/GetWithTheGuidelines/Best-Practices-Center-Overview_UCM_305211_Article.jsp#.V0dkDfkrKCg

[19] Access the National Association of County & City Health Officials' Model Practice Database here: http://archived.naccho.org/topics/modelpractices/database/

[20] Access the United States Public Health Service Task Force here: http://www.uspreventiveservicestaskforce.org/Page/Name/recommendations

Innovation is still encouraged. If a new policy, program, or intervention is unique, innovative, or a pilot, it is helpful to consider building an evaluation plan into the program design. The experiment can then be analyzed and can contribute to the existing knowledge base. Also available are many outside resources and partnerships to aid in the design and evaluation of the implementation of new policies, programs and interventions.[21] Documenting and sharing the success of initiatives throughout the state will allow innovation to serve as a building block for others to leverage as they seek to improve health in their own communities.

[21] For additional details on resources for evaluation, see the section titled State Plan for Improving Population Health and Appendix D.

An Actionable Repository

The State Health Plan now features an actionable repository of opportunities and recommendations that can be used by groups at all levels to improve health in their communities. The majority of opportunities and recommendations were developed through the SIM process outlined in the section titled State Plan for Improving Population Health. The details that underlie these recommendations, created by our academic partners, are included in the content of this edition of the State Health Plan. The repository also includes best practices from across the state, as well as programs offered by TDH.

The opportunities and recommendations have been organized into an Excel-based repository, an overview of which can be found in Appendix D. They are organized around two key themes: Places & Spaces and Levers. Places & Spaces refers to the area in which those opportunities and recommendations can be implemented and the different parties and stakeholders who may influence health. Places & Spaces can include regional and local health departments, state and local governments, community planning groups, and the local business community. Levers refers to the different levers each group can pull to make that change, be it through financial, political, medical, social, or environmental means.

Figure 5 – Repository Organizational Structure

The repository is also sortable by the health topics on which groups may wish to focus. The opportunities and recommendations provided in the repository tend to be aligned with the guiding questions of the State Health Plan, meaning they are often evidence-based and focused on primary prevention. The goal of this repository is to provide a resource for stakeholders and interested parties at all levels of health and health care to find established, successful opportunities and ideas for improving health in their communities. In this way, the State Health Plan becomes a living tool for stakeholders from different domains of health to learn from each other and work together to improve the health of the people in Tennessee.

The content of this repository will continue to grow and be refined over time. TDH plans for this repository to become more robust as new initiatives are completed and as TDH explores additional health topics and identifies new and existing best practices across the state.

Progress and Evaluation (Tennessee's Vital Signs)

Rather than setting formal objectives and goals, the State Health Plan will begin measuring progress by evaluating how the health outcomes of the state align with specific measures of the National Academy of Medicine's Vital Signs that will be adapted to be Tennessee-specific. The selection of this set of Tennessee-centric measures is in progress and will be finalized in a future update to the State Health Plan. Annual progress towards the state's health goals will be reported on an annual basis. This report will also discuss how new initiatives uphold the Five Principles for Achieving Better Health.

National Academy of Medicine's Vital Signs

One of the key features of an effective improvement plan is having specific measures to track progress. For the State Health Plan, evaluative metrics will be developed from the National Academy of Medicine's (NAM) Vital Signs core measures with input from stakeholders.[22] These core measures were developed by the National Academy of Medicine in conjunction with Blue Shield of California, the California Healthcare Foundation, and the Robert Wood Johnson Foundation. They follow a four-domain framework, focusing on healthy people, care quality, lower cost, and engaged people. The NAM recommends the application of these Vital Signs at every level of health and health care, and across sectors.

The goal of NAM's Vital Signs is to provide consistent benchmarks for health progress across the nation. By using an adapted set of Vital Signs core measures, the State Health Plan will be able to focus on true progress towards the state's goals for health. TDH has begun a process of identifying Tennessee-specific metrics to be used to measure health and progress at the state level. These metrics will likely follow the NAM Vital Signs framework outlined here, but will use specific measures that are more relevant to the Tennessee and the problems the state faces. Over the next few months, TDH will further engage the public to determine what those measures should be.

The core measure set, shown in Table 1, was proposed by the Committee on Core Metrics for Better Health at Lower Cost (Committee), which was responsible for the Vital Signs report. Each core measure focus represents an important area for action at all levels of government and health. The Committee also proposed the best currently available measures for each core measure focus, for which data is currently available at the national level. These are listed as best current national measures in Table 3. To provide additional texture and allow for more granular analysis, the Committee provided related priority measures, shown in Table 2. As a whole, these measures provide a starting set of "vital signs" for tracking progress towards improved health and health care in the nation.[23]

[22] For more information on the National Academy of Medicine's Vital Signs, visit: http://www.nationalacademies.org/hmd/Reports/2015/Vital-Signs-Core-Metrics.aspx

[23] IOM (Institute of Medicine). 2015. Vital signs: Core metrics for health and health care progress. Washington, DC: The National Academies Press.

Table 1 – Core Measure Analytic Framework

Domain	Key Element	Core Measure Focus
Healthy People	Length of life	Life expectancy
	Quality of life	Well-being
	Healthy behaviors	Overweight and obesity Addictive behavior Unintended pregnancy
	Healthy social circumstances	Healthy communities
Care Quality	Prevention	Preventive services
	Access to care	Care access
	Safe care	Patient safety
	Appropriate treatment	Evidence-based care
	Person-centered care	Care match with patient goals
Care Cost	Affordability	Personal spending burden
	Sustainability	Population spending burden
Engaged People	Individual engagement	Individual engagement
	Community engagement	Community engagement

Source: IOM (Institute of Medicine). 2015. Vital signs: Core metrics for health and health care progress. Washington, DC: The National Academies Press.

While the Vital Signs core measure set provides a valuable starting place, the new, initial framework for the State Health Plan provides an opportunity for a set of metrics to be tailored to the needs of Tennessee so that they better address the unique health landscape of the state. The core measure set shown in Table 2 was provided to all State Health Plan focus group attendees[24] for discussion. Groups were asked to specify which of the core and priority measures make sense for Tennessee, and how they would adapt these measures to make them more relevant for the state. Participants also identified any gaps in these measures as they pertain to defining the overall health of Tennessee.

[24] For more information on the State Health Plan focus groups, see the section titled Development Process. For associated materials, see Appendix C

Table 2 – Core Measure Set with Related Priority Measures

Core Measure Focus	Related Priority Measures
Life Expectancy	Infant mortality Maternal mortality Violence and injury mortality
Well-Being	Multiple chronic conditions Depression
Overweight & Obesity	Activity levels Healthy eating patterns
Addictive Behavior	Tobacco use Drug dependence/illicit use Alcohol dependence/misuse
Unintended Pregnancy	Contraceptive use
Healthy Communities	Childhood poverty rate Childhood asthma Air quality index Drinking water quality index
Preventive Services	Influenza immunization Colorectal cancer screening Breast cancer screening
Care Access	Usual source of care Delay of needed care
Patient Safety	Wrong-site surgery Pressure ulcers Medication reconciliation
Evidence-Based Care	Cardiovascular risk reduction Hypertension control Diabetes control composite Heart attack therapy protocol Stroke therapy protocol Unnecessary care composite
Care Match with Patient Goals	Patient experience Shared decision making End-of-life/advanced care planning
Personal Spending Burden	Health care-related bankruptcies
Population Spending Burden	Total cost of care Health care spending growth
Individual Engagement	Involvement in health initiatives

Community Engagement	Availability of healthy food Walkability Community health benefit agenda

Source: IOM (Institute of Medicine). 2015. Vital signs: Core metrics for health and health care progress. Washington, DC: The National Academies Press.

Public focus group discussants recommended additional key elements, core measure focus areas, and related priority measures. A portion of these recommendations are met by the Vital Signs core measure set when the best current national measures are included. For each core measure focus, the Committee provided an associated best current measure. The best current measure represents the established metric reported at a national level that best captures the intent of the core measure focus. The core measure set including the best current measure can be found in Table 3. New key elements recommended by focus groups were: mental health, oral health, health system engagement, and political engagement. New measures recommended by focus groups included: uninsured and underinsured rates. According to focus group participants, the highest priority core measure focuses for their regions are: overweight and obesity, addictive behavior, mental health, oral health, preventive services, care access, personal and population spending burdens, and individual and community engagement.

Table 3 – Core Measure Set with Best Current National Measure

Domain	Key Element	Core Measure Focus	Best Current Measure
Healthy people	Length of life	Life expectancy	Life expectancy at birth
	Quality of life	Well-being	Self-reported health
	Healthy behaviors	Overweight and obesity	Body mass index (BMI)
		Addictive behavior	Addiction death rate
		Unintended pregnancy	Teen pregnancy rate
	Healthy social circumstances	Health communities	High school graduation rate
Care quality	Prevention	Preventive services	Childhood immunization rate
	Access to care	Care access	Unmet care need
	Safe care	Patient safety	Hospital-acquired infection (HAI) rate
	Appropriate treatment	Evidence-based care	Preventable hospitalization rate
	Person-centered care	Care match with patient goals	Patient-clinician communication satisfaction
Care cost	Affordability	Personal spending burden	High spending relative to income
	Sustainability	Population spending burden	Per capital expenditures on health care
Engaged people	Individual engagement	Individual engagement	Health literacy rate
	Community engagement	Community engagement	Social support

Source: IOM (Institute of Medicine). 2015. Vital signs: Core metrics for health and health care progress. Washington, DC: The National Academies Press.

TDH is in the process of finalizing a Tennessee-specific set of Vital Signs based on feedback from stakeholders across the state at multiple levels of health and government. As the new initial framework of the State Health Plan continues to be refined, so will the set of metrics used to measure and track the state's progress in achieving optimal health for all people in Tennessee.

Five Principles for Achieving Better Health

Previous updates to the State Health Plan use the framework of the Five Principles for Achieving Better Health, first set forth in the 2010 edition, to set Goals and Objectives to improve the health of people in Tennessee. The Five Principles include:

1. **Healthy Lives:** The purpose of the State Health Plan is to improve the health of people in Tennessee.
2. **Access:** People in Tennessee should have access to health care and the conditions to achieve optimal health.
3. **Economic Efficiencies:** Health resources in Tennessee, including health care, should be developed to address the health of people in Tennessee while encouraging value and economic efficiencies.
4. **Quality of Care:** People in Tennessee should have confidence that the quality of care is continually monitored and standards are adhered to by providers.
5. **Workforce:** The state should support the development, recruitment, and retention of a sufficient and quality health workforce.

In addition to using the modified NAM Vital Signs, progress will be measured each year by evaluating how new initiatives at TDH, including future State Health Plan updates, uphold the Five Principles for Achieving Better Health. These Principles will grow in their function from being a guiding framework to instead being a tool to ensure that the State Health Plan and other efforts of the Department continue to consider specific health care needs.

Principle 1, Healthy Lives, will inform the continued shift of the State Health Plan's focus on population health. *Principle 2, Access*, will remain integral as initiatives work to remedy disparities in health outcomes for underserved populations. *Principle 3, Economic Efficiencies*, will be addressed through commitment to explore evidence-based policies, programs, and interventions that are proven to utilize funds efficiently. *Principle 4, Quality of Care*, will be included during discussions of health outcomes and related measures. *Principle 5, Workforce*, will be considered as partnerships continue to grow between health departments, policymakers, and health care service providers.

Annual Report

Tennessee law[25] requires the Division of Health planning to prepare an annual report for the General Assembly. This report is utilized to inform the state legislature of the work performed by the Division annually and to provide any needed updates on the health status of the state. The Division of Health Planning will use each year's legislative update as a platform to inform the Legislature of the work of the Division and to track progress of the health status of the state. The report will discuss progress made in improving the health of the people in Tennessee. Success will be measured by improvements in the chosen and adapted NAM Vital Signs, by alignment with the Five Principles for Achieving Public Health, and by adherence to the new guiding questions of the State Health Plan.

[25] Tennessee Code Annotated § 68-11-1625, see Appendix A.

State Plan for Improving Population Health

State Innovation Model Grant Overview

The Tennessee Division of Health Care Finance and Administration (HCFA) received CMS SIM Test Award in the spring of 2015. Tennessee was one of eleven states to receive this award. The State Innovation Models (SIM) Initiative provides financial and technical support to states as they design and test innovative health care delivery and payment models. These models are designed to improve health system performance, increase quality of care, and decrease costs for all residents of participating states, including Medicare, Medicaid, and Children's Health Insurance Program (CHIP) beneficiaries.[26]

The majority of this $65 million grant is being used for work related to the Tennessee Health Care Innovation Initiative, Governor Haslam's payment reform program. This award supports the goal of the Initiative: "to make health care in Tennessee a value-based system focused on efficiency, quality of care, and the patient experience." The efforts of the Governor and HCFA have support from private insurers, the state employee benefit plan, and TennCare.[27]

In addition to supporting innovative health care delivery and payment models, the SIM award conditionally requires the development of a Plan for Improving Population Health. A portion of the SIM grant funds were allocated to this work. HCFA contracted with TDH to develop a statewide Plan for Improving Population Health. According to CMS, the Plan for Improving Population Health should assess the overall health of the state and identify measurable goals, objectives, and interventions that enable the state to improve the health of the entire state population, improve the quality of health care across the state, and reduce health care costs.[28] In this way, the goals of the SIM Plan for Improving Population Health are closely married to the goals of the Tennessee State Health Plan. As such, the majority of the content of the 2015 Edition of the State Health Plan comes from the process used to develop the statewide Plan for Improving Population Health.

[26] For more information on the Centers for Medicare & Medicaid Services' State Innovation Models Initiative, visit: https://innovation.cms.gov/initiatives/state-innovations/

[27] For more information on Tennessee's Health Care Innovation Initiative, visit: https://www.tn.gov/hcfa/section/strategic-planning-and-innovation-group

[28] For more information on the requirements of the State Innovation Models: Round Two of Funding for Design and Test Assistance, visit: https://innovation.cms.gov/Files/x/StateInnovationRdTwoFOA.pdf

Development Process

The SIM work began with a conclave with the Centers for Disease Control and Prevention in Chattanooga. At this conclave, representatives of TennCare, TDH, and the CDC met to review evidence, define a strategy, and consider lessons learned from other SIM states. TDH incorporated the key considerations and ideas from that discussion into the subsequent steps in the overall State Population Health Improvement Plan development process.

Next, TDH contracted with five schools of public health located in Tennessee to develop regional population health improvement plans (PHIPs) that focus on five health topics identified by the Centers for Medicare and Medicaid Innovation (CMMI). These health topics are: obesity, diabetes, tobacco use, perinatal health, and child health. In order to develop regional plans, the schools were asked to perform qualitative and quantitative analyses and use a grassroots community engagement approach to identify causal factors associated with the selected health topic.

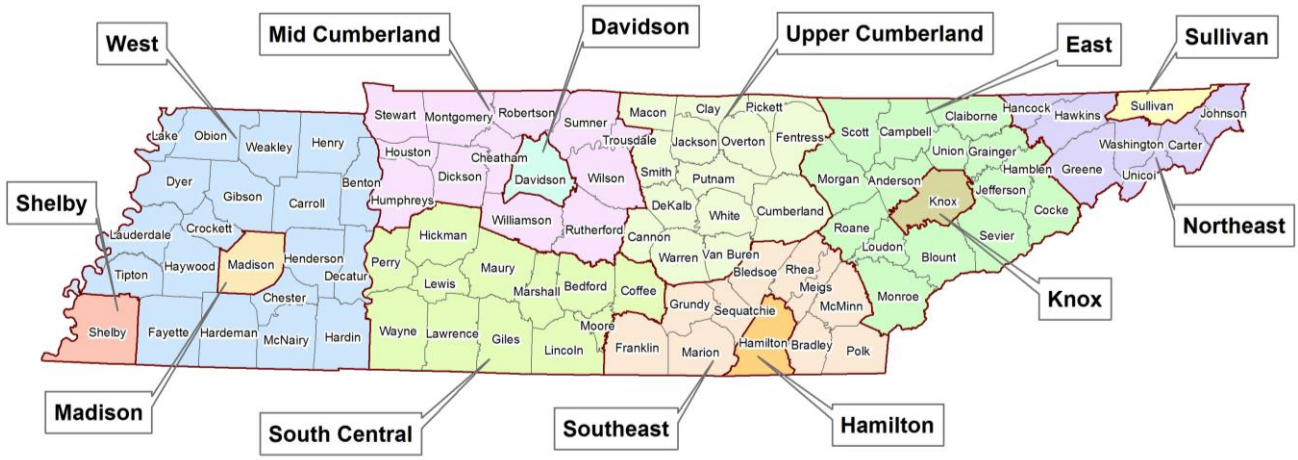
Table 4 shows each academic partner, the chosen health topic, and the selected region of study. The table is followed by a map, Figure 6, of the Tennessee Health Department Regions[29]. Each region contains a mix of urban and rural areas, as well as diverse populations, as required by CMS. Through this initiative, our academic partners engaged stakeholders in five of the six metropolitan regions and five of the seven health regions.

Table 4 – Public Health Schools and Research Areas

Academic Partner	Health Topic	Regions
University of Tennessee-Knoxville	Perinatal Health	East TN + Knox
Tennessee State University	Child Health	Mid-Cumberland + Davidson
East Tennessee State University	Tobacco Use	Northeast TN + Sullivan
Meharry Medical College	Diabetes	Mid-Cumberland + Davidson
University of Memphis	Obesity	West TN + Shelby + Madison

[29] Map of the Tennessee Health Department Regions can be found at: https://tn.gov/assets/entities/health/attachments/TDH_Regions.pdf

Figure 6 – Health Regions of Tennessee



TDH's contract with each school defined a specific scope of work. Schools were required to compile a summary assessment report identifying prevalence, factors, and services associated with the regional health topic. During the development of this assessment, the schools collected and analyzed publically available secondary data[30] to explore the chosen health topic and impacted populations. This included evaluating standard risk, morbidity and mortality data, the use of health services, and region-to-state and region-to-national comparisons when available.

Key informant interviews were conducted with major regional service stakeholders and insurers to identify factors relevant to the health topic, such as the populations most impacted by the issue, any disparities suffered by subpopulations, and the health systems and services required to improve population health for the chosen health issue. Schools also held focus groups and community meetings to identify causal factors associated with the prevalence of their health topic or illness, existing regional population health disparities, and any gaps in availability and access of preventive treatment services associated with the standard continuum of care.

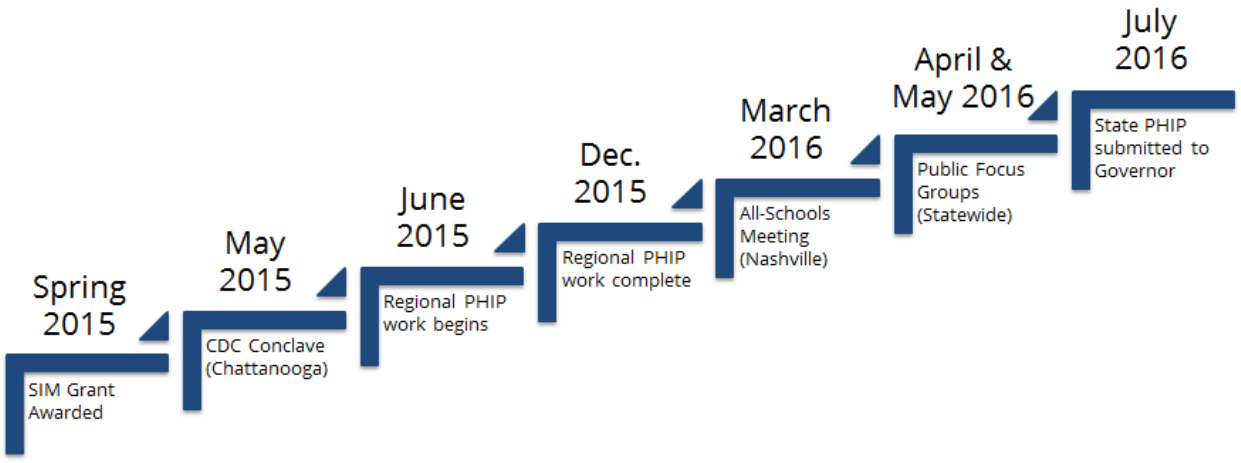
After gathering and analyzing primary and secondary data, the schools were asked to draft regional goals for change in the following categories: primary prevention, secondary prevention, health services delivery, and health status and outcomes. The goals and recommendations addressed access to services, health workforce requirements (or gaps), and services financing, which includes organizational patterns, capacity grants, and insurance reimbursement. The recommendations also commented on the degree to which population health services for the

[30] Data provided by the Department of Health's Division of Policy, Planning and Assessment, Department of Education, and Department of Economic & Community Development, as well as other available sources, such as local school districts.

chosen health issue are currently (and should be) integrated into systems across service providers and across society sectors (e.g. health care, education, and employment services). Additionally, the schools identified needs for additional population-level data, which would enable health issue surveillance including health risk appraisals, screening results, health services utilization, and vital statistics. The schools were encouraged to evaluate the needs for population and personal health education, such as anticipatory guidance protocols, and to look at environmental controls including regulating hazards and promoting built environment strategies.

Each school conducted a one-day regional stakeholder meeting to assess the findings, consider goals, and generate ideas for regional objectives. Participants in these stakeholder meetings included representatives from the for-profit and not-for-profit provider communities, as well as an assortment of payers, volunteers, employers, and community workers.[31]

Figure 7 – State Innovation Model Timeline



On March 3-4, 2016, the Division of Health Planning held the SIM All Schools Meeting at Meharry Medical College in Nashville. During this conference, each school received peer review and thoughtful feedback on its regional goals, and participated in multiple discussions focused around how to effectively scale those goals and recommendations to the state level. On the first day, research teams presented their regional plans, goals, and recommendations to an audience of subject matter experts from TDH, local health departments, TennCare, and the Department of Education. On the second day, all attendees participated in small group breakouts on each topic to discuss the statewide scalability of each regional plan's goals and recommendations. These breakout discussions were focused on evaluating the proposed recommendations for their potential scalability to the state level, including identifying any potential barriers to implementation or overlap with existing opportunities. Each school considered the feedback they received during the SIM All Schools Meeting and updated its regional PHIPs accordingly. [32]

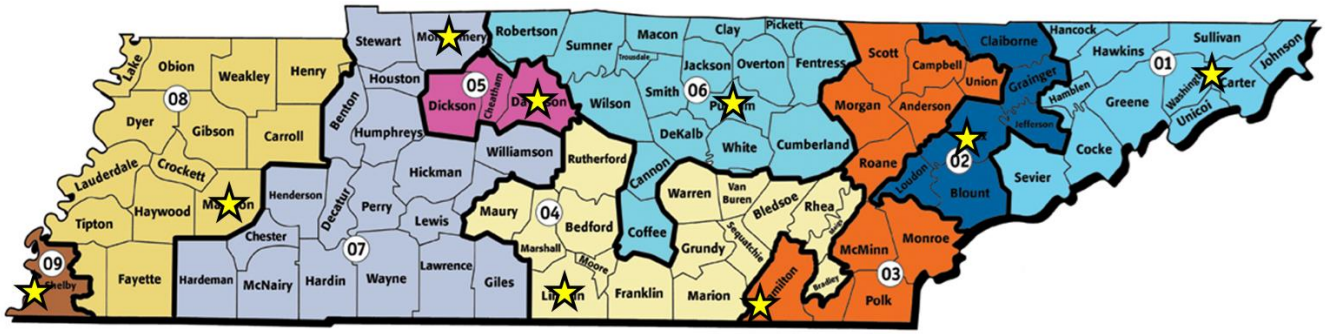
[31] For a detailed list of participants in regional stakeholder meetings, see Exhibit 1.
[32] The supplemental materials and group discussion themes from the SIM All-Schools Meeting are available in Appendix

In April and May 2016, TDH hosted nine public focus groups across the state, one in each U.S. Congressional District. These were held in a mix of urban, rural, and suburban areas. Attendees included local and regional government representatives, public and private stakeholders, and the general public. The goals were: to present the proposed changes to the State Health Plan framework and the updated goals, recommendations, and opportunities formed by our academic partners; to solicit feedback from those with vested interests in public health and health care; and to obtain endorsement from stakeholders who pledge to help achieve these goals. Table 5 provides the schedule and locations of the focus groups. Figure 8 shows the U.S. Congressional districts in Tennessee.[33] Starred are the locations of the focus groups.

Table 5 – Public Focus Group Schedule

City	Date
Knoxville	April 20, 2016
Chattanooga	April 21, 2016
Clarksville	April 26, 2016
Nashville	April 27, 2016
Cookeville	April 28, 2016
Gray	April 29, 2016
Fayetteville	May 3, 2016
Jackson	May 4, 2016
Memphis	May 5, 2016

Figure 8 – Tennessee's U.S. Congressional Districts and Focus Group Locations



Each focus group lasted between two and three hours. The time was broken up into two main sessions: the first focused on the initial framework and structural changes to the State Health Plan

B of this document.

[33] This map can be found at: http://www.teateachers.org/contact-information

while the second focused on the content of the Population Health Improvement Plan. Each session ended with a group discussion, where participants were asked to provide critical feedback on the proposed guiding questions for the State Health Plan, on which of the NAM Vital Signs core measures are the most pertinent for Tennessee, and on how relevant each health topic is to the participants' region. Additionally, we supplied the participants with a subset of recommendations and opportunities provided by the schools and asked them to evaluate how effective each one would be in improving population health in their region. Participants were also asked to identify any potential barriers or challenges to the implementation of the recommendations provided.[34]

The feedback provided throughout the process was analyzed for trends and incorporated into this update. From this process, an easy-to-use repository was developed to house the well-researched opportunities and recommendations for improving population health in the areas of perinatal health, child health, tobacco use, diabetes, and obesity. The recommendations in this repository closely mirror those initially provided by each academic partner as part of its regional, topic-specific population health improvement plan. The recommendations have been scaled up to the state level where applicable.

These opportunities and recommendations, and the research that led to their development, are detailed in the following five sections.[35]

[34] The supplemental workshop materials and group discussion prompts are available in Appendix C of this document.
[35] All opportunities and recommendations can be found in Appendix D.

Perinatal Health (University of Tennessee – Knoxville)

Overview

From a technical perspective, perinatal health pertains to the health of both mother and fetus or infant during the perinatal period. The World Health Organization (WHO) defines the perinatal period as beginning at twenty-two completed weeks (154 days) of gestation and ending seven completed days after birth. Perinatal mortality refers to the number of stillbirths and deaths in the first week of life (early neonatal mortality). The Centers for Disease Control and Prevention (CDC) defines the perinatal period beginning with a minimum of twenty weeks gestation. From a more holistic perspective, however, perinatal health may span a much longer timeframe, incorporating preconception health, the entire prenatal period, and the health of both mother and infant through the infant's first year of life.

Measures of perinatal health often include infant and/or fetal mortality, birth weight, provision of prenatal care, and maternal behavioral risks before and during pregnancy. Several perinatal health-related measures that are tracked in the annual America's Health Rankings show Tennessee to be struggling: 2014 rankings (with 1 being best, 50 being worst) reveal Tennessee as 41st for infant mortality, 44th for low birth weight, 40th for preterm birth, and 41st for teen birth rate.[36]

Other measures of perinatal health paint a different picture. Data from CDC's Pregnancy Risk Assessment Monitoring System (PRAMS)[37] indicate that Tennessee meets or exceeds national-level findings for: entry into prenatal care when the mother sought care (80.8% for TN vs. 82.1% for the US); pregnancy intention[38] (49.9% for TN vs. 55.7% for the U.S.); and obtaining an infant health check within one week of delivery (92.3% for TN vs. 92.0% for the U.S.). On balance, however, Tennessee's overall measures of perinatal health indicate that the state is in the lower tier in terms of health outcomes.

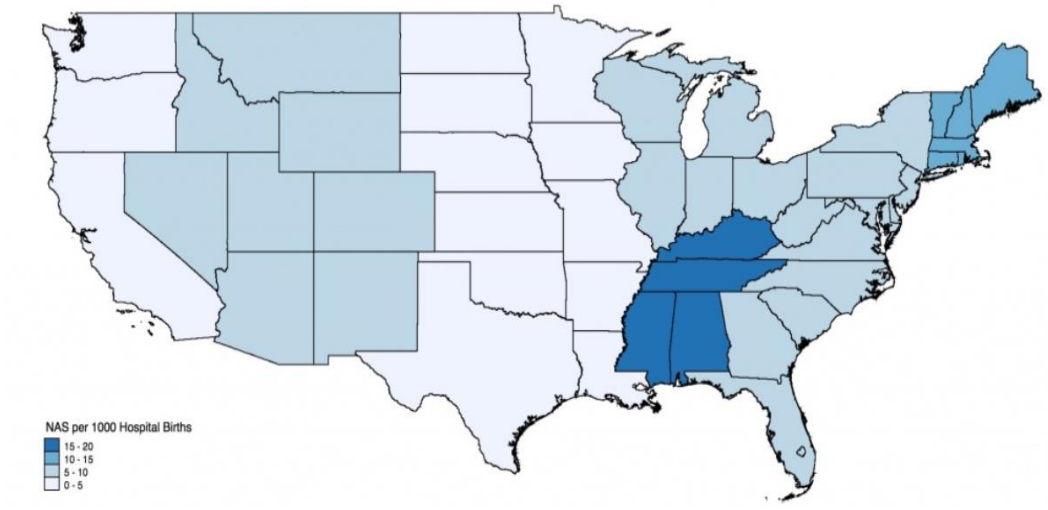
During the development of its regional population health improvement plan for perinatal health, the University of Tennessee-Knoxville (UTK) worked closely with the Knoxville/Knox County Community Health Council (CHC) and the East Tennessee Regional Health Council, which has representation from each of the fifteen County Health Councils in the East Tennessee region. When engaged on the topic of their leading concern in the area of perinatal health in East Tennessee, participants overwhelmingly cited Neonatal Abstinence Syndrome (NAS). The cause of

[36] United Health Foundation. America's Health Rankings. 2014; http://www.americashealthrankings.org/states. Accessed 12/01, 2015.
[37] Centers for Disease Control and Prevention. Pregnancy Risk Assessment Monitoring System (PRAMS). 2015; http://www.cdc.gov/prams/pramstat/index.html. Accessed 12/01, 2015.
[38] An unintended pregnancy is defined as a pregnancy that is either unwanted or mistimed at the time of conception. Current definitions of unintended pregnancy also include women who are ambivalent about their pregnancy. Mohllajee, A. P., K. M. Curtis, B. Morrow, and P. A. Marchbanks. "Pregnancy Intention and Its Relationship to Birth and Maternal Outcomes." Obstetrics & Gynecology 109.3 (2007): 678-86. Web.

NAS is maternal opioid drug use during pregnancy, whether prescribed legally or obtained illicitly.[39] Communities across East Tennessee are struggling with this problem, which has high health and societal costs. This struggle is evidenced by the fact that stakeholders from neonatal intensive care units (NICU) across the area reported through the interview process that as many as half of their infants were NAS babies.

Over the past decade, Tennessee has seen a nearly ten-fold rise in the incidence of babies born with NAS. Infants with NAS stay in the hospital longer than other babies and they may have serious medical and social problems.[40] Statewide, there were 1,018 infants diagnosed with NAS in 2014, up from 936 in 2013, for rates of 12.7 and 11.7 per 1,000 live births, respectively. Nationwide during this same timeframe, the incidence of NAS increased four-fold from 7 per 1,000 admissions to 27 per 1,000.[41] From 2009 to 2012, Tennessee was among the four states with the highest rates of NAS births, which can be seen in Figure 9.[42]

Figure 9 – NAS Births by State



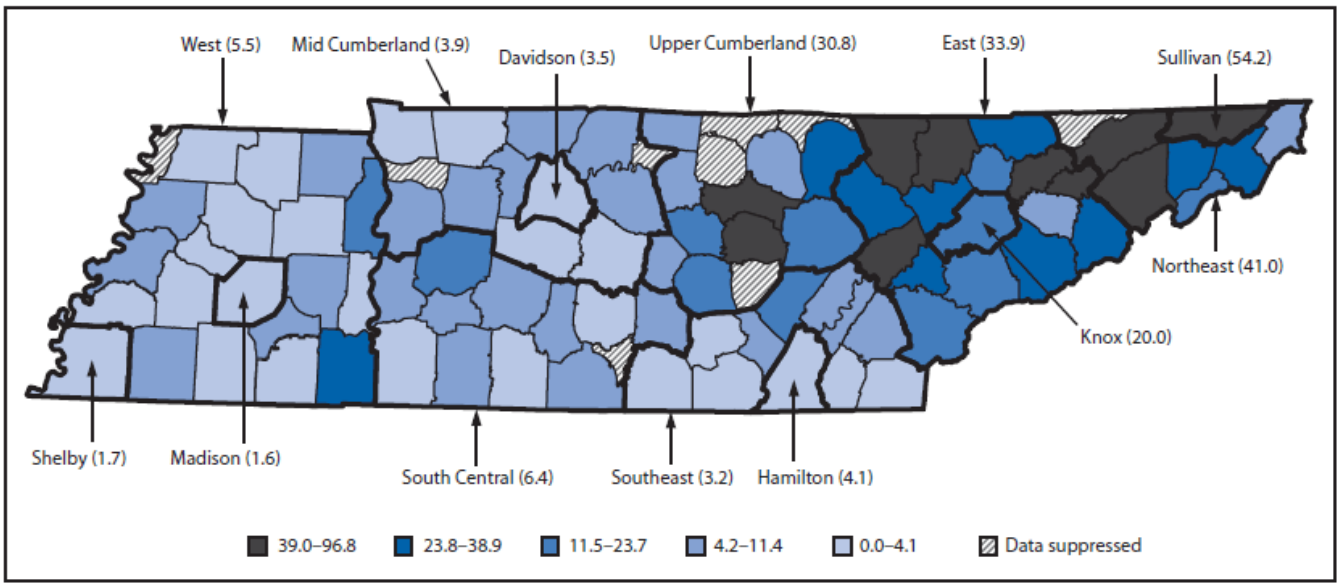
Source: Patrick SW, Davis MM, Lehmann CU, Cooper WO. Increasing Incidence and Geographic Distribution of Neonatal Abstinence Syndrome: United States 2009-2012. Journal of Perinatology.

While NAS rates differ substantially across the U.S., reported NAS cases also vary considerably across Tennessee. Figure 10 shows the rate of NAS per 1,000 live births by mother's county of residence and TDH region in 2013. As shown, the eastern Tennessee area has experienced

[39] For more on NAS, see: https://www.nlm.nih.gov/medlineplus/ency/article/007313.htm
[40] Tennessee Department of Health. Neonatal Abstinence Syndrome. 2015; http://tn.gov/health/topic/nas. Accessed 12/09, 2015.
[41] Tolia VN, Patrick SW, Bennett MM, et al. Increasing Incidence of the Neonatal Abstinence Syndrome in U.S. Neonatal ICUs. New England Journal of Medicine. 2015;372(22):2118-2126.
[42] Patrick S, Davis M, Lehman C, Cooper W. Increasing incidence and geographic distribution of neonatal abstinence syndrome: United States 2009 to 2012. Journal of Perinatology. 2015

significantly higher rates of NAS compared to the state as a whole.

Figure 10 – NAS Births by County and Region



Source: Warren MD, Miller AM, Traylor J, Bauer A, Patrick SW. Implementation of a Statewide Surveillance System for Neonatal Abstinence Syndrome—Tennessee, 2013. MMWR. Morbidity and mortality weekly report. 2015;64(5):125-128. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6405a4.htm

According to UTK's research based on the East Tennessee region in 2013 and 2014, infants with a hospital discharge diagnosis of NAS were significantly different from infants without a hospital discharge diagnosis of NAS in several different ways.

- **Maternal characteristics:** Mothers with NAS infants tended to be older, more likely to be unmarried, non-Hispanic white, have smoked cigarettes during pregnancy, and have a history of Hepatitis C and herpes simplex.
- **Health services characteristics:** Mothers with NAS infants received less prenatal care.
- **Delivery characteristics:** Mothers with NAS infants were more likely to have indications of infection and abnormal conditions at the time of delivery.
- **Infant characteristics:** Infants with NAS were more likely to be low birthweight and to be admitted to the Neonatal Intensive Care Unit.

According to UTK's research, NAS also constitutes a substantial financial burden for both public and private insurers. The hospital costs for newborns with NAS were $66,700 on average,

compared to $3,500 for those without NAS – an approximately 20-fold difference. UTK estimates that NAS births added an estimated $34.3 million to TennCare's hospital costs in 2013 and 2014.

In summary, NAS has been increasing nationwide over the past ten to fifteen years; Tennessee is among the states with the highest NAS rates; and NAS rates in eastern Tennessee surpass the state average by as much as five-fold. In addition to the increased incidence of NAS, other perinatal health issues are taking root across the state as well, such as infant mortality, low birthweights, preterm births, gestational diabetes, smoking and consuming alcohol during pregnancy, and a basic lack of available prenatal and perinatal care.

According to the March of Dimes, babies born at low birthweight (less than 5 lb. 8 oz.) are more prone to certain neonatal health conditions such as respiratory distress syndrome, bleeding in the brain, heart problems, digestive issues, and vision loss. Additionally, low birthweight babies are more likely to develop certain chronic diseases later in life such as diabetes, heart disease, high blood pressure, metabolic syndrome, and obesity.[43] In Tennessee, 1 in 8 babies (12.6% of births) were born preterm (fewer than 37 weeks)[44] in 2013 while only 11.39% of U.S. births were preterm. Among Tennessee births in 2013, 7.5% of singleton births were low birthweight while 8.0% of U.S. babies were born low birthweight.[45]

From 2010 to 2012, the infant mortality rate in Tennessee was 7.5 deaths per 1,000 live births.[46] This rate is slightly higher than the average U.S. infant mortality rate, which was approximately 6 deaths per 1,000 live births during the same time period.[47] Tennessee's infant mortality rate for African Americans (12.9 deaths per 1,000 live births) is over twice that of whites (6.3 per 1,000 live births), indicating significant racial disparities across the state. [48]

According to the National Institute of Health, mothers who develop gestational diabetes are more likely to have delivery complications and the babies themselves are more likely be born with low blood sugar, develop breathing problems, and have a higher chance of dying before or soon after birth.[49] The prevalence of gestational diabetes among Tennessee women was 9.2% in 2014.[50]

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[43] For more information on the complications of low birthweight, visit: http://www.marchofdimes.org/complications/low-birthweight.aspx

[44] March of Dimes. Tennessee 2014 premature birth report card. 2014; http://www.marchofdimes.org/pdf/tennessee/premature-birth-report-card-tennessee2.pdf. Accessed 12/09, 2015.

[45] National Center for Health Statistics. Births: Final Data for 2013. 2015; http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_01.pdf. Accessed 12/09, 2015.

[46] Tennessee Department of Health. Infant Mortality in Tennessee 2003-2012. 2014; https://tn.gov/assets/entities/health/attachments/IMreport_2014.pdf. Accessed 12/09, 2015.

[47] See more at: http://mchb.hrsa.gov/chusa13/perinatal-health-status-indicators/p/infant-mortality.html & http://www.cdc.gov/nchs/fastats/infant-health.htm

[48] Tennessee Department of Health. Infant Mortality in Tennessee 2003-2012. 2014; https://tn.gov/assets/entities/health/attachments/IMreport_2014.pdf. Accessed 12/09, 2015.

[49] For more information on gestational diabetes, visit: http://www.niddk.nih.gov/health-information/health-topics/Diabetes/gestational-diabetes/Pages/index.aspx

For low-income women who may not be able to afford adequate care, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) was developed at the federal level. WIC helps states provide supplemental food, health care referrals, and nutrition education for low income women who are pregnant or postpartum, and to infants and children up to age five who are found to be at nutritional risk.[51] WIC provides a vital resource for women who may not otherwise be able to afford or access prenatal and postpartum care. In 2011, 45.4% of pregnant women in the U.S. reported being on WIC during their pregnancy;[52] 2013 Tennessee data indicate that 52.4% of pregnant women participated in WIC.[53] In Tennessee, in 2013, 71.1% of births were to women who began prenatal care in the first trimester, 22.3% began care in the second trimester, and 4.6% in the third trimester; 1.9% of births were to women who received no prenatal care.[54]

Another known perinatal health issue in the state is smoking during pregnancy. According to the CDC, smoking during pregnancy causes health problems such as premature birth, certain birth defects, and infant death.[55] In 2013, 16% of Tennessee birth certificates indicated tobacco use in pregnancy.[56] In the 2011 PRAMS report, 17.8% of women in Tennessee reported smoking cigarettes during pregnancy with significant differences by geography and race: 22.5% in rural areas compared to 11.9% in urban areas and 22.2% for whites compared to 9.9% for African Americans.[57]

Perinatal depression is another common health issue mothers face.[58] Infants of mothers suffering from perinatal depression are more likely to have a difficult temperament and to experience cognitive and emotional delays. It is estimated that at least 13% of women experience major depressive disorder (MDD) while pregnant and 11-20% suffer from postpartum depressive symptoms. These numbers can be even higher in more vulnerable groups like young, single mothers and those with history of stress, loss, or trauma. Additionally, up to 51% of

[50] National estimates of gestational diabetes were not available due to variation in screening and/or diagnostic criteria, as well as variation in reporting requirements.
[51] For more information on WIC, visit http://www.fns.usda.gov/wic/women-infants-and-children-wic & https://tn.gov/health/article/wic-fact-sheet
[52] Centers for Disease Control and Prevention. PRAMStat. 2015; http://nccd.cdc.gov/PRAMStat. Accessed 12/09, 2015.
[53] Tennessee Department of Health. Tennessee Pregnancy Risk Assessment Monitoring System 2011 summary report. http://tn.gov/assets/entities/health/attachments/2011_TN_PRAMS_Summary_Report.pdf. Accessed 12/09, 2015.
[54] Tennessee Department of Health. Report of Tennessee births 2013. 2015; http://tn.gov/assets/entities/health/attachments/TNBirths13.pdf. Accessed 12/09, 2015.
[55] For more information on the risks of smoking during pregnancy, visit: http://www.cdc.gov/reproductivehealth/maternalinfanthealth/tobaccousepregnancy/
[56] Tennessee Department of Health. The health of Tennessee's women. A summary report of mortality and women's health issues. 2015; http://tn.gov/assets/entities/health/attachments/39923-WomensHealth2013_3-15_%282%29.pdf. Accessed 12/09, 2015.
[57] Tennessee Department of Health. Tennessee Pregnancy Risk Assessment Monitoring System 2011 summary report. http://tn.gov/assets/entities/health/attachments/2011_TN_PRAMS_Summary_Report.pdf. Accessed 12/09, 2015.
[58] Perinatal depression is associated with poor outcomes for both mothers and babies.

socioeconomically disadvantaged women report depressive symptoms during pregnancy.[59]

Opportunities and Recommendations

The University of Tennessee-Knoxville (UTK) developed goals to improve the perinatal health system with a focus on NAS.

The five main goals are as follows:

- Maximize preconception health
- Improve early entry into prenatal care
- Improve the early identification of those at risk for NAS
- Decrease NAS births
- Decrease the prevalence of unintended pregnancy

UTK and its stakeholders identified three primary drivers for how to achieve those goals: 1) utilization of care, 2) integration of services, and 3) healthy behaviors and supporting environments. UTK and its stakeholders also identified secondary drivers that affect each primary driver in an effort to outline more actionable steps to improve perinatal health related to NAS. The primary and secondary drivers effecting UTK's NAS goals are listed in the Figure 11.

[59] Muzik, Maria, and Stefana Borovska. "Perinatal Depression: Implications for Child Mental Health." *Mental Health in Family Medicine* 7.4 (2010): 239–247. Print.

Figure 11 – Primary and Secondary Drivers of NAS Goals

Utilization of Care	Integration of Services	Healthy Behaviors and Supporting Environments
•Improve access to and quality of prenatal care and comprehensive services for pregnant women •Improve availability of preconception health •Improve access to mental health and gender-specific substance abuse services •Improve linkages and reduce barriers between providers of mental health and substance abuse services •Identify and reduce barriers to obtaining services and coordination of services	•Improve communication, understanding, and awareness of NAS between health care, law enforcement, the judicial system, and school systems. •Increase the number and reach of coordinators of care •Improve the understanding of primary, secondary, and tertiary prevention •Enhance the integration of medical care, addiction services, and behavioral health care •Increase knowledge of addiction in general, and NAS in particular, across health disciplines including both policymakers and the general public •Identify and remove barriers that prohibit or limit the integration of services	•Reduce stigma to accessing mental health and substance abuse services •Increase awareness of NAS prevention and treatment and accountability among health care providers (including those in the fields of MAT, prenatal health and recovery) •Reduce childhood and adolescent adverse childhood experiences (ACEs). •Decrease the isolation of communities (e.g. transportation and lack of local services) •Provide education on healthy relationships

To accomplish these goals, the following recommendations were developed:

1. Establish a regional NAS Task Force and include representatives from health councils, provider groups, community groups, patient advocacy groups, addiction counseling groups, and school systems with additional involvement from law enforcement, the judicial system, and elected officials. The NAS Task Force would be charged with:
    a. Reviewing and updating the goals, and primary and secondary drivers impacting those goals,
    b. Developing action plans to address the secondary drivers (which may, for example, be carried out through establishing three Action Teams, one for each primary driver), and
    c. Overseeing the implementation and evaluation of action plans.
2. Fund a full-time NAS Task Force Coordinator, to be housed at either a metro or regional health department, whose roles and responsibilities would include:
    a. Facilitating the work of the NAS Task Force,
    b. Providing annual reports on NAS in the region, and
    c. Serving as the primary liaison with the TDH Central Office regarding NAS.

3. Review provisions for preconception pregnancy testing and contraception use in the setting of opioid prescription use.
4. Review provisions for prenatal screening for opioid use and for ongoing surveillance for opioid use during pregnancy.
5. Fund additional research on NAS, which might include:
    a. A qualitative study involving women whose infants were born with NAS, to better understand the environment in which drug use during pregnancy takes place,
    b. An impact evaluation of Public Chapter 820[60], which stipulates that a woman can be charged with a misdemeanor if she illegally uses narcotics during pregnancy and if the baby is harmed as a result,[61]
    c. An assessment of mental health and addiction recovery services offered in the state with special attention to those serving pregnant women or women with children, and
    d. Both formative and impact evaluations regarding recommendations 1a-1c above.

National funding opportunities to support the amelioration of NAS can be divided into three primary areas: 1) basic research, 2) community participatory research, and 3) intervention research (including primary, secondary, and tertiary prevention). The federal government, particularly through the National Institute of Health, is the primary funder for research related to NAS. The majority of funding streams found were in the area of primary research. Three sources were found for community participatory research, and two were associated with intervention efforts. The funds within these three areas are typically not mutually exclusive as many of the calls for proposals provide some leeway (for example, incorporating a community participatory approach to basic or intervention research). [62]

Additionally, significant work is already under way in improving perinatal health. The Tennessee Adolescent Pregnancy Prevention Program exists to prevent adolescent pregnancies through a comprehensive, community-wide, collaborative effort that promotes abstinence, self-respect, constructive life options, and responsible decision-making about sexuality, healthy relationships and the future.[63] TDH also offers family planning resources and education to provide families with helpful information on where to access related health services.[64]

The Maternal and Child Health (MCH) Section, part of the TDH's Division of Family Health and Wellness (FHW) offers various programs for women, infants, children, and adolescents, as well as

[60] For more information on Public Chapter 820, visit http://www.tn.gov/sos/acts/108/pub/pc0820.pdf
[61] This law will no longer be in effect on and after July 1, 2016, as it was not renewed by Tennessee's 109th General Assembly
[62] For the full list of funding opportunities, please visit Appendix D.
[63] To learn more about the Tennessee Adolescent Pregnancy Prevention Program, visit: https://www.tn.gov/health/article/MCH-TAPPP-about
[64] For more on Family Planning Resources, visit: https://www.tn.gov/health/article/MCH-familyplanning-resources

programs to improve services for women and children.[65] This includes information on accessing newborn screenings[66] and preventing Sudden Infant Death Syndrome.[67] MCH houses the Perinatal Regionalization Program, which provides for the diagnosis and treatment of certain life-threatening conditions of pregnant women and newborn infants.[68] MCH runs the Healthy Baby Initiative, reducing preterm births through a partnership with the March of Dimes, the Tennessee Initiative for Perinatal Quality Care, and the Tennessee Hospital Association.[69] They also offer the MCH Block Grant, which helps provide maternal and child health services in Tennessee by supporting programs targeting improvement in the health of women and infants with special health care needs.[70]

MCH offers Fetal and Infant Mortality Review (FIMR), an action-oriented, evidence-based community review process to review fetal and infant deaths. FIMR works at the community level to develop programs and influence policy that will lead to improved birth outcomes. Currently, there are FIMR projects in Davidson, Hamilton, Knox, and Shelby counties, along with the East Tennessee region.[71] The FHW has also developed primary prevention initiative modules targeted to decrease infant mortality, prevent teen pregnancy, address substance abuse, and control tobacco use.[72] These modules are both learning and teaching tools that may help to address certain root factors effecting perinatal health.

An early intervention tool for identifying and discussing risky substance abuse is the Screening, Brief Intervention, and Referral to Treatment (SBIRT) screening program, which has been proven effective for patients who are not struggling from addiction but who are at risk for serious health concerns due to their substance abuse.[73] The Tennessee Department of Mental Health and Substance Abuse Services (TDMHSAS) also provides resources specific to substance abuse and prevention, such as community coalitions.

For more information on how to improve perinatal health in your community, see Appendix D.

[65] For more on MCH, visit: https://www.tn.gov/health/section/MCH
[66] For more on newborn screenings, visit: https://www.tn.gov/health/section/newborn-screening
[67] For more on Sudden Infant Death Syndrome, visit: https://www.tn.gov/health/topic/MCH-sids
[68] For more on the Perinatal Regionalization Program, visit: https://www.tn.gov/health/topic/MCH-prp
[69] For more on the Healthy Babies initiative, visit: https://www.tn.gov/health/article/healthy-babies
[70] For more on the MCH Block Grant, visit: https://www.tn.gov/health/topic/MCH-blockgrant
[71] For more on the Fetal and Infant Mortality Review, visit: https://www.tn.gov/health/topic/MCH-fimr
[72] For more on FHW's Primary Prevention Initiative Modules, visit: https://www.tn.gov/health/article/FHW-ppi-modules
[73] For more on SBIRT http://www.integration.samhsa.gov/clinical-practice/SBIRT

Child Health (Tennessee State University)

Overview

Tennessee ranks 36th in the country for child health and well-being.[74] Additionally, unhealthy children are more likely to mature into unhealthy adults, a trend which has negative economic and psychosocial effects on the population. As a result, investing in children's health is an investment into a healthy, well-adjusted future workforce to drive the state's economy.

Each day in the U.S.:

- 4 children are killed by abuse or neglect
- 5 children or teens commit suicide
- 67 babies die before their 1st birthday
- 914 babies are born to teen mothers
- 1825 children are confirmed to have been abused or neglected
- 2712 babies are born into poverty
- 2857 students drop out of high school

Source: Children's Defense Fund, 2016 http://www.childrensdefense.org/

Tennessee struggles with multiple child health issues, including infant mortality. In 2014, 6.9 infants died per 1,000 live births in the state of Tennessee. This is slightly higher than the national infant mortality rate of 6 deaths per 1,000 live births. Some counties in Tennessee have infant mortality rates much higher. In 2013, Trousdale County saw 20.4 deaths per 1,000 live births. In 2014, Houston and Humphries counties saw infant mortality rates of 10.4 and 10.7 per 1,000 live births respectively. [75]

Additionally, adverse childhood experiences (ACEs) are common in Tennessee. ACEs are traumatic experiences that disrupt a child's growth environment and can have negative long-term health consequences, such as obesity, cancer, violence, depression, smoking, and substance abuse. Examples of ACEs include child maltreatment (physical, sexual, and psychological) and neglect, as well has living as part of a dysfunctional family where members may struggle from substance abuse or mental illness, are or have been incarcerated, suffer from domestic violence, or have gone through divorce. In 2012, 52% of the state's population had at least one ACE, while 21% had experienced three or more.[76]

[74] 2015 Kids Count Data Book, State Trends in Child Well-Being, July 21, 2015, pp. 1-56, Baltimore MD, Annie E. Casey Foundation

[75] Centers for Disease Control and Prevention, Atlanta, GA, Tennessee Mortality Data 2014; Kids Count, The State of the Child in Tennessee, Tennessee Commission on Children and Youth, 2014

[76] For more on ACEs, visit: https://tn.gov/assets/entities/health/attachments/Tennessee_ACE_Final_Report_with_Authorization.pdf

It is estimated that half of all lifetime cases of mental illness begin by age 14, making mental health screenings integral for children. Screenings are also important because parents are often ill-equipped to identify the symptoms of mental illness in children without appropriate training. Additionally, offering support for young children and their parents when it comes to managing difficulties early in life may prevent the development of such disorders altogether.[77] Common mental health conditions children experience include, anxiety disorders, attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), eating disorders (e.g. anorexia nervosa, bulimia nervosa, and binge-eating disorder), mood disorders (e.g. depression and bipolar disorder), and schizophrenia.[78]

Tennessee's children also struggle with obesity. Tennessee sees a greater prevalence of obesity among children 10 to 17 years old than the national average (20.5% in Tennessee compared to 17% nationally). More significantly, obesity rates for Tennessee children between the ages of 2 and 4 are seven times higher than the national average, as 14.2% of these children are obese compared to the national average of 2%.[79]

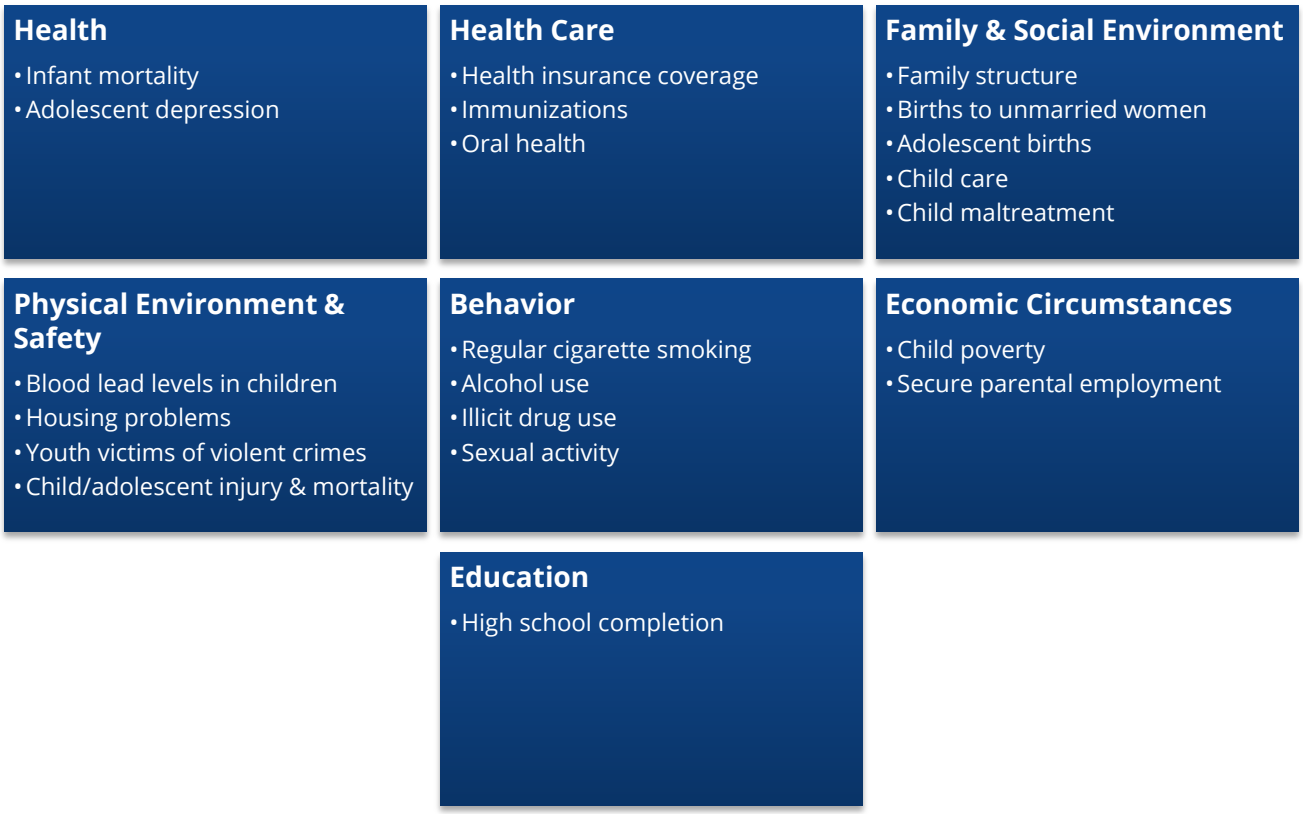
Another prevalent health issue affecting children in Tennessee is asthma. According to the Agency for Healthcare Research and Quality, asthma is the most common reason for hospitalizations among 3-5 year olds and 6-12 year olds.[80] In 2007, Tennessee had the 22nd highest current childhood asthma prevalence and the 27th highest lifetime childhood asthma prevalence among the 50 states. In 2010, there were 7,059 inpatient hospitalizations and 37,462 Emergency Department visits in Tennessee for a primary diagnosis of asthma. The length of stay for those inpatient asthma hospitalizations ranged from 0-52 days, with a median of 3 days. With almost two-thirds of asthma charges, $113.6 million, coming from inpatient hospitalizations, asthma has a substantial financial burden. Though asthma is not curable, it can be controlled and managed. Additionally, environmental factors, including characteristics of the community where people live, work, and play may also increase their risk of having an asthma attack.[81]

Tennessee State University (TSU) used America's Children's Key National Indicators of Well-Being as the specific focus areas and measures to evaluate child health in Tennessee. The Office of Management and Budget has focused 23 federal agencies on prioritizing 41 key indicators that define reliable and easily-understood aspects of children's lives that also affect their health.[82]

[77] For more on children's mental health, visit: http://www.nimh.nih.gov/health/publications/treatment-of-children-with-mental-illness-fact-sheet/index.shtml
[78] http://www.mayoclinic.org/healthy-lifestyle/childrens-health/in-depth/mental-illness-in-children/art-20046577
[79] The State of Obesity, Better Policies for a Healthier America 2014, Trust for America's Health, pp. 1-136; Washington D.C. 2015
[80] For more from the AHRQ on asthma, visit: http://archive.ahrq.gov/data/hcup/factbk4/factbk4.htm
[81] Jones L, Bauer A, Li Y, Croom F (2012). The Burden of Asthma in Tennessee: 2001- 2010. Tennessee Department of Health, Nashville, TN.
[82] These indicators were published by the Federal Interagency Forum on Child and Family Statistics in a document

These national indicators demonstrate trends over time and are organized into seven categories: Health, Health Care, Family & Social Environment, Physical Environment & Safety, Behavior, Economic Circumstance and Education. Figure 12 shows the indicators considered by TSU to be vital to the improvement of child health in Tennessee at a population level:

Figure 12 – Vital Child Health Indicators



According to TSU's research and the findings of their Regional Children's Health Summit, the causal factors most impacting children's health are: births to adolescents; child poverty; child injury (including neglect and/or abuse); access to quality, comprehensive care; chronic illness (e.g. obesity, or mental health issues); poor birth outcomes (resulting in higher infant mortality); environmental tobacco smoke; and education.

Opportunities and Recommendations

According to TSU's work, improving child health can be achieved through education, increased early access to care, focusing on behavioral and mental health screening and services, parental and familial awareness, provider engagement, and a system of coordination.

entitled: American's Children: Key National Indicators of Well-Being, 2013.

Community-Centered Health Neighborhoods

One recommendation for improving child health at the population level is to implement a Community-Centered Health Neighborhood based on the Accountable Health Community Model.[83] This model addresses the gap between health care and community services by identifying and rectifying health-related social needs of community members such as food insecurity and lack of stable housing. By addressing the social determinants that directly and indirectly impact child health, this approach serves to decrease total health care costs, improve health outcomes, and increase the quality of care of children.

Community-Centered Health Neighborhoods include all individuals eligible for Medicare and Medicaid, as well as the uninsured. The model increases access by directly providing resources to address non-medical needs that impact health and improves quality by closing the loop in patient-centered[84] care by addressing the needs of the individual over the needs of the medical practice.

The model promotes collaboration between the clinical sector and the community through screening community members to identify certain unmet, health-related, social needs. The approach promotes referring community members to community services, which increases awareness of such services. It provides navigation services to help high-risk community members access those services, and encourages alignment between clinical and community services to ensure that those services are available and responsive to the needs of the community members.

The key behind Community-Centered Health Neighborhoods is coordinating traditional health care services with non-traditional, community-based prevention services that affect health, and incorporating them into the standard delivery model. Some evaluations, such as the evaluation of the medical homes established by Group Health Cooperative, estimate that this approach produces a return of investment of 1.5 to 1, indicating that for every dollar spent to implement the patient-centered medical home, Group Health received $1.50 in return through various cost-saving mechanisms.[85] These returns may come from improved patient follow-through on referrals and treatment plans, which decrease the need for additional medical interventions.

Additionally, this model benefits from the employment of a Community Care Coordination System. Such a system focuses on data interoperability and personalized service coordination to ensure that community members, health care providers, and community service providers have access to all of the information necessary to help community members achieve optimal health. These technical tools provide the opportunity and delivery of community services to those in need and to identify the specific needs and goals of families and individuals in the community. In this

[83] For more on Accountable Health Communities, see https://innovation.cms.gov/initiatives/AHCM
[84] According to the Institute of Medicine, "patient-centered" refers to providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions.
[85] Robert J. Reid, Katie Coleman, Eric A. Johnson, Paul A. Fishman, Clarissa Hsu, Michael P. Soman, Claire E. Trescott, Michael Erikson and Eric B. Larson, The Group Health medical Home At Year Two: Cost Savings, Higher Patient Satisfaction, And Less Burnout For Providers, Health Affairs 29, no. 5 (2010):835-843, doi: 10.1997/hlthaff.2010.0158

way, they promote appropriate success pathways that are personalized to each community member and they connect organizations and initiatives to share information in order to improve the livability of the community.

Community Grand Rounds

Another recommendation to improve child health at the population level is to bridge the knowledge gap between the local communities and the health care providers who serve them. Community Grand Rounds are a play on traditional medical grand rounds, the teaching and learning tool consisting of presenting medical problems and treatment of a particular patient to an audience of doctors, residents and students. Successful Community Grand rounds utilize a local provider or medical professional who is well-respected in the community. This approach offers an opportunity for community members and the health care community to engage in dialogue about expected health outcomes associated with certain behaviors and what the role of the communities could be in improving their own health. This model promotes awareness and the translation of ideas across different groups to build a common understanding and a more educated community. This partnership allows professionals to work within an existing social infrastructure to develop dialogue and to easily build rapport and trust with the local community.

Early and Effective Assessments

A third recommendation for improving child health is to make early screenings more accessible to all children, in particular ACE assessments, behavioral and mental health screenings, EPSDTs[86], and autism screenings.

The CDC offers many screening tools and guidelines for autism screenings. According to the CDC, ASD can be detected at 18 months or younger, allowing infants to get the help they need as early as possible. Early intervention can help reduce developmental delays and other consequences of untreated autism.[87]

MCH offers various programs for infants, children, and adolescents, as well as programs to improve children's services,[88] including the MCH Block Grant. This grant helps provide services in Tennessee specifically for children with special health needs.[89] MCH Priority Areas for the Block Grant include childhood overweight/obesity, unintentional injury among children, asthma care, and tobacco use. MCH also administers the Tennessee Adolescent Pregnancy Prevention Program, which provides comprehensive, evidence-based, and medically accurate programs to middle school children and incorporates community-based awareness strategies to prevent adolescent

[86] For more on Early and Periodic Screening, Diagnostic and Treatment (EPSDTs), visit: https://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Early-and-Periodic-Screening-Diagnostic-and-Treatment.html
[87] For CDC's autism screening guidelines and resources, visit: http://www.cdc.gov/ncbddd/autism/screening.html
[88] For more on MCH, visit: https://www.tn.gov/health/section/MCH
[89] For more on the MCH Block Grant, visit: https://www.tn.gov/health/topic/MCH-blockgrant

pregnancy.[90] FHW has also developed primary prevention initiative modules targeted to decrease infant mortality, prevent teen pregnancy, address substance abuse, and control tobacco use.[91] These modules are learning and teaching tools that help address certain root factors effecting perinatal health.

TDH runs the Asthma Management Initiative, the mission of which is to promote lung health and reduces asthma by providing asthma data and resources. The program offers four different toolkits designed for varying audiences, including children, parents, providers, and communities.[92] MCH also provides additional resources for child care professionals and educators to help children manage asthma.[93]

TDH also offers services for children and youth with special health care needs. This includes the Children's Special Services (CSS) Program, which provides coverage for comprehensive medical care for children with physical disabilities. Additionally, there are multiple programs centered on developing integrated community systems to serve children and youth with special health care needs.[94]

MCH facilitates the Early Childhood Program[95]. This program oversees various projects such as the Help Us Grow Successfully (HUGS) program, which is geared toward improving pregnancy outcomes, improving maternal and child health and wellness, improving child development, and maintaining and improving family strength and stability.[96]

In addition to work being done by TDH, TDMHSAS provides a best practices repository serving the mental and behavioral health needs of children and adolescents, as well as a set of guidelines for youth therapy and treatment.[97]

For more information on how to improve child health in your community, see Appendix D.

[90] For more on the Tennessee Adolescent Pregnancy Prevention program, visit: https://www.tn.gov/health/topic/MCH-TAPPP
[91] For more on FHW's Primary Prevention Initiative Modules, visit: https://www.tn.gov/health/article/FHW-ppi-modules
[92] For more on the Asthma Management Initiative, visit: https://www.tn.gov/health/topic/MCH-asthma
[93] For additional asthma resources, visit: https://www.tn.gov/health/article/MCH-asthma-additional
[94] For more on services for Children and Youth With Special Health Care needs, visit: https://www.tn.gov/health/topic/MCH-cyshcn
[95] For more on the Early Childhood Program, visit: https://www.tn.gov/health/topic/MCH-homevisitation
[96] For more on the Help Us Grow Successfully program, visit: https://www.tn.gov/health/article/MCH-hv-hugs
[97] For Best Practices for Children & Adolescents with mental and behavioral health issues, visit: https://tn.gov/behavioral-health/article/behavioral-health-guidelines-for-children

Tobacco Use (East Tennessee State University)

Overview

Tobacco use is the leading preventable cause of morbidity and mortality in the United States. Tobacco (including exposure to secondhand tobacco smoke) accounts for over 480,000 annual deaths[98], more than 10 years of potential life lost,[99] and over $300 billion in annual economic costs.[100] Yet, about 1 in 5, or over 42 million, people continue to smoke[101] and the tobacco industry spends over $10 billion to advertise, market, and promote tobacco products.[102] Tobacco use primarily consists of cigarette smoking and the use of smokeless tobacco products (SLTs). However, there is an uptake in the use of alternative tobacco products, including electronic nicotine delivery systems (ENDS) or e-cigarettes.[103] Addressing this major public health issue requires tobacco control.

The harmful effects of tobacco use to health have been established[104] for both men and women.[105] Additionally, tobacco remains the leading cause of preventable morbidity and mortality in the U.S.[106] Tobacco use (both smoked and smokeless) is linked to several diseases, such as cancer, cardiovascular disease, respiratory disease, metabolic disease, and perinatal disease. Additionally, secondhand smoke (SHS) exposure causes disease in nonsmokers. It has been shown to cause lung and coronary disease in adults and to exacerbate respiratory diseases, like asthma, in children and infants.[107] Although tobacco use and SHS exposure are associated with diseases in

[98] Xu, J, Kochanek KD, Murphy SL, Tejada-Vera B. Deaths: final data for 2007. Natl Vital Stat Rep. United States; 2010 May;58(10):1-19.
[99] According to the CDC, years of potential life lost (YPLL) is a measure of the impact of premature mortality on a population. This measure shows the years that the average person would have continued to live, if not for some disease or illness.
[100] Xu X, Bishop EE, Kennedy SM, Simpson SA, Pechacek TF. Annual healthcare spending attributable to cigarette smoking: an update. Am J Prev Med. Netherlands; 2015 Mar;48(3):326–33.
[101] Jamal A, Homa DM, O'Connor E, Babb SD, Caraballo RS, Singh T, et al. Current Cigarette Smoking Among Adults - United States, 2005-2014. MMWR Morb Mortal Wkly Rep. United States; 2015;64(44):1233–40.
[102] Federal Trade Commission (FTC). Cigarette Report for 2012 [Internet]. Federal Trade Commission. 2015 [cited 2015 Nov 25]. Available from: https://www.ftc.gov/system/files/documents/reports/federal-trade-commission-cigarette-report-2012/150327-2012cigaretterpt.pdf
[103] Loomis BR, Rogers T, King BA, Dench DL, Gammon DG, Fulmer EB, et al. National and State-Specific Sales and Prices for Electronic Cigarettes-U.S., 2012-2013. Am J Prev Med. 2015 Jun;
[104] WHO, IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Human, IARC Monographs, Volume 83: Tobacco Smoke and Involuntary Smoking. Lyon, France: WHO, IARC; 2004
[105] USDHHS. Smoking and Women: A report of the Surgeon General [Internet]. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health,. 2001 [cited 2015 Nov 24]. Available from: http://www.cdc.gov/tobacco/data_statistics/sgr/2001/index.htm
[106] Johnson NB, Hayes LD, Brown K, Hoo EC, Ethier KA. CDC National Health Report: leading causes of morbidity and mortality and associated behavioral risk and protective factors--United States, 2005-2013. MMWR Surveill Summ. United States; 2014 Oct;63 Suppl 4:3–27.
[107] USDHHS. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. 2014.

almost all parts of the human body, the three major tobacco-induced diseases in the U.S.[108] and Tennessee[109] are cancer, cardiovascular diseases (CVD), and respiratory diseases.

According to East Tennessee State University (ETSU)'s research, tobacco use among adults in Tennessee is above the national average (24.3% in TN compared to 18.1% in the U.S. in 2013). Tobacco use in Tennessee accounts for 11,400 annual deaths and over $5 billion in economic costs including both the direct costs of medical care and the indirect costs of lost productivity.[110] In 2014, the overall ranking of the health status of Tennessee was 43rd out of all 50 states.[111] Additionally, the prevalence of smokeless tobacco products (e.g. chewing tobacco and dip) in Tennessee was 6.5% among adults from 2010 to 2011[112] and 13.3% among youth in 2013.[113]

The main goals that emerged out of the ETSU's regional work on tobacco use were to protect the entire population from exposure to tobacco use (including ENDS) and SHS, to prevent initiation of tobacco use (including ENDS) in youth and young adults, and to make cessation aids and counseling available, accessible, and affordable for people who intend to quit using tobacco. The additional goals identified are to foster collaboration among stakeholders, and across sectors, and to monitor data through research to inform policies and programs.

As such, ETSU divided their analysis, goals, and recommendations into three main categories:

1. **Protection** from exposure to tobacco use and second/third-hand smoke
2. **Prevention** of initiation of tobacco use in youth and young adults
3. **Cessation** of tobacco use by adults or established users

Additionally, according to the CDC, smoking prevalence is much higher among people with a mental illness. Nearly 1 in 5 adults have some form of mental illness, and 36% of these people smoke cigarettes compared to 21% of adults without mental illness. Of people with mental illness who live below the poverty line, 48% smoke. This differential may be explained by nicotine's mood-altering affects that put those with mental illness at higher risk for addiction. Cigarette smoking may also be used as an alternative coping mechanism for those with anxiety or other

[108] USDHHS. The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2010.
[109] Department of Health D of HP. State of Tennessee: 2010 Tennessee State Health Plan. Nashville, TN: Tennessee Department of Health; 2011.
[110] CDC. Prevention Status Reports 2013: Tobacco Use- Tennessee [Internet]. CDC. 2014 [cited 2015 Dec 6]. Available from: http://www.cdc.gov/psr/tobacco/2013/tn-tobacco.pdf
[111] The United Health Foundation, American Public Health Association, Partnership for Prevention. America's Health Rankings [Internet]. United Health Foundation. 2014 [cited 2015 Dec 6]. Available from: http://www.americashealthrankings.org/Measures/Measure/TN/Smoking
[112] CDC, from the Tobacco Use Supplement to the Current Population Survey (TUS-CPS)
[113] CDC, Youth Risk Behavioral Surveillance System (YRBSS)

mood disorders.[114]

Opportunities and Recommendations

When it comes to protecting communities from tobacco exposure, ETSU identified the needs for a comprehensive tobacco control program, for better enforcement of existing policies, for better enforcement of tobacco retail laws, and to reduce exposure to SHS in children. Popular and effective methods to achieve protection from tobacco exposure include moving towards regulating smoking in vehicles with children, education about smoke-free homes and housing units, and the placement of tobacco-free signage in public places.

Many of the regional participants were passionate about the state preemption of tobacco, which would enable localities to define stricter tobacco laws and policies related to public secondhand smoke. Another available policy lever is to decrease tobacco use through higher tobacco taxes or an increased base price for tobacco products (including ENDS). Revenue from such a tax could be utilized to fund tobacco prevention programs. Higher insurance premiums and co-pays for tobacco users is another financial method to deter tobacco use.

ETSU also identified the need for tobacco (and ENDS) industry counter-marketing campaigns, for the development of the local infrastructure for tobacco control, and for a sustainable tobacco control research program. Such research would provide better assessment of tobacco use status, which would provide an improved opportunity for coordination of policies and programs among stakeholders.

In regards to preventing new smokers from using tobacco, ETSU cited the need for a comprehensive, school-based tobacco program. One option is the Michigan Model for Health, a comprehensive, skills-based health education curriculum which includes tobacco use.[115] The Michigan Model's curriculum aligns very closely to the Tennessee Health Education Standards.[116] Currently, 41.4% of Tennessee schools use the Michigan Model. Other education programs used in Tennessee schools include: Kick Butts Day,[117] a national day of activism that empowers youth against tobacco that is used in 12.4% of Tennessee schools; the Great American Smoke-Out, an American Cancer Society-sponsored event used in 7.5% of Tennessee schools to encourage smokers to quit or to use the day to make a quit plan; and Health Rocks!,[118] a healthy living program where teen and adult facilitators share hands-on activities that educate youth on the consequences of tobacco, alcohol, and drug use. Health Rocks! is used in 4.8% of Tennessee schools.

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[114] For more on smoking and mental illness, visit: http://www.cdc.gov/features/vitalsigns/smokingandmentalillness/
[115] For more on the Michigan Model, visit: http://www.emc.cmich.edu/EMC_Orchard/michigan-model-for-health
[116] For more on The Tennessee Health Education Standards, visit: https://www.tn.gov/education/article/health-pe-wellness-standards
[117] For more on Kick Butts Day, visit: http://www.kickbuttsday.org/
[118] For more on Health Rocks!, visit: http://www.4-h.org/youth-development-programs/kids-health/programming-resources/preventative-health-safety/health-rocks/

ETSU also recommends expanding prevention efforts to reach young adults, coordinating prevention efforts across sectors and stakeholders, and increasing the knowledge and awareness regarding ENDS in youth and all populations. According to ETSU, such efforts could be funded through Master Settlement Agreement (MSA) revenue by increasing the use of MSA funds to the levels recommended by the CDC. The CDC recommends that 18% of total MSA revenue be used for investment into a statewide comprehensive tobacco control program. In Tennessee, only 9.2% of MSA revenue was earmarked for tobacco control efforts.

To aid in the cessation of tobacco use by current smokers, ETSU recommends: universal screening and cessation treatment in health care, workforce, and community settings; increasing access to and education on nicotine replacement therapies; and an assessment of the Tennessee Quitline. Also helpful in promoting the cessation of tobacco would be the expansion of ongoing efforts such as BABY & ME – Tobacco Free, or similar evidence-based, culturally tailored programs for pregnant smokers. Providing cessation aids and counseling for the mental health population who struggle with addiction for many different reasons is another effective approach. A key recommendation to promote cessation among the uninsured population is to determine the feasibility of making tobacco screening and cessation treatment mandatory in safety-net populations. In order to be successful and mindful during all cessation programs, there should be coordination of cessation efforts across sectors.

ETSU highlighted local best practices for tobacco control, such as the Northeast Regional Health Department's implementation of the BABY & ME – Tobacco Free[119] incentive program, Sullivan County Regional Health Department's "Unsmokeable" media campaign, ETSU's tobacco-free college campus, and Mountain States Health Alliance's nicotine-free workforce and smoke-free campus.

These recommendations are consistent with the Best Practice recommendations of the U.S. Centers for Disease Control and Prevention (CDC), which suggest the need for funding tobacco control efforts in the state at the level recommended by the CDC.

TDH offers the Tennessee Tobacco Quitline where anyone can call and speak to someone about tobacco cessation. The Quitline also offers an online cessation program free of charge. These services provide personalized support to help with the quitting process.[120] TDH also offers additional online resources to help promote prenatal, youth, and adult cessation, as well as fact sheets and specific resources for health care professionals.[121]

[119] For more on BABY & ME – Tobacco Free, visit: http://www.babyandmetobaccofree.org/
[120] For more on the Tobacco Quitline, visit: http://tn.gov/health/topic/FHW-tobacco
[121] To access TDH's tobacco resources, visit: http://tn.gov/health/article/FHW-tobacco-resources

FHW offers PPI modules targeted to tobacco use, prevention, and control, among other issues.[122] These modules are learning and teaching tools which may help to address certain causal factors effecting tobacco use. The PPI website also includes references to PPI Bright Spots, which are successful and innovative community projects that have been deemed best practices that can be easily replicated.[123]

TMDHSAS also offers many programs related to substance abuse and works regularly to prevent tobacco use, especially among youth. According to TMDHSAS, all Tennessee psychiatric hospitals and substance abuse centers have smoke-free campus policies to discourage tobacco use among the vulnerable population they serve.

For more information on how to reduce tobacco use in your community, see Appendix D.

[122] For more on FHW's Primary Prevention Initiative Modules, visit: https://www.tn.gov/health/article/FHW-ppi-modules
[123] For more on PPI's Bright Spots, visit: http://tn.gov/health/article/FHW-ppi-brightspots

Diabetes (Meharry Medical College)

Overview

Diabetes is a disease in which blood glucose levels are above normal. Our bodies make insulin, a hormone created by the pancreas, to help process glucose and make it usable by the body's cells. When someone has diabetes, their body either does not make enough insulin or cannot use its own insulin as well as it should. This causes sugar to build up in your blood. This high blood sugar, which is diagnosed as diabetes when it reaches above-normal levels, can cause additional health issues, such as blindness, heart disease, kidney failure, and loss of lower limbs.[124]

According to the CDC, about 1 in every 11 people in the U.S. has diabetes, which accounts for 29.1 million Americans. Of those 29.1 million people, 1 in 4 does not know they have diabetes. Additionally, 86 million, or 1 in 3 American adults, have prediabetes. Of these 86 million people, 90% do not know they have prediabetes and are at risk of developing diabetes. Type 2 diabetes accounts for 95% of diabetes diagnoses and is therefore the focus of the diabetes research by Meharry Medical College (MMC).[125]

In 2014, 11.7% of adults had diabetes in Tennessee (compared to the national average of 9.3%)[126] and diabetes was the state's seventh leading cause of death. Complications related to diabetes, including heart disease, stroke, and kidney failure, also made up 3 of the top 10 leading causes of death in Tennessee.[127] The American Diabetes Association estimates that in 2012, the total cost of diabetes in the state, including direct medical expenses and indirect costs from lost productivity, was $6.6 billion. In general, medical expenses are about 2.3 times higher for people with diabetes than those without diabetes.[128]

In 2014, black and Hispanic populations had higher incidence rates of diabetes diagnosis than whites.[129] Additionally, rural areas have a 17% higher diabetes prevalence rate compared to urban areas.[130] According to MMC's research, the Northwest and Northeast regions of Tennessee have the highest prevalence of diabetes, while the Mid-Cumberland region, including the Nashville metro area, has the lowest.

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[124] For more on diabetes, visit http://www.cdc.gov/diabetes/basics/diabetes.html
[125] For more on diabetes, visit: http://www.cdc.gov/diabetes/pubs/statsreport14/diabetes-infographic.pdf
[126] CDC Division of Nutrition, Physical Activity, and Adult Obesity, 2013
[127] For more on Tennessee's causes of death, see https://www.tn.gov/assets/entities/health/attachments/TnDeaths13.pdf
[128] For the ADA's evaluation of the burden of diabetes in Tennessee, see http://main.diabetes.org/dorg/PDFs/Advocacy/burden-of-diabetes/tennessee.pdf
[129] Centers for Disease Control and Prevention (CDC), National Center for Health Statistics, Division of Health Interview Statistics, data from the National Health Interview Survey. Data computed by personnel in CDC's Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion.
[130] Keppel KG, Pearcy JN, Klein RJ : Measuring progress in Healthy People 2010. Healthy People 2010 Stat Notes 25:1-16, 2004

Diabetes may also affect a person's mental health and vice versa. Depression is twice as common in people with diabetes than in the general population.[131] Depression also presents in almost 20% of people with diabetes worldwide. For Type 2 diabetes, the causes of depression in diabetes appear to be bidirectional, with diabetes exacerbating depression and depression contributing to worse outcomes for people with diabetes.[132]

Opportunities and Recommendations

MMC's qualitative analysis followed the Social Ecological Model,[133] emphasizing the importance of socioeconomic, political, environmental, social, cultural, and community factors in addition to individual factors. There was also a focus on personal and interpersonal relationships and reactions to diabetes.

To address individual factors of diabetes, MMC recommends providing more awareness and education around diabetes designed similarly to education efforts for infectious diseases. Various individual vantage points should be considered when diabetes education is being developed or provided in order to ensure cultural relevancy. Another option is for families that practice healthy living in the community to be utilized as a model for the rest of the community. This gives community members the opportunity to learn best practices for a healthy lifestyle from their peers. Increasing diabetes screenings and providing on-the-spot counseling when diagnoses are delivered helps to ensure individuals get the care they need. Additionally, educating providers on diabetes prevention strategies and support services allows providers to better address the rise of prediabetes and prevent its progression.

At an interpersonal level, MMC encourages individuals to seek guidance from dietitians about proper food preparation for family and social events. Because food is a standard accompaniment for many family and social events in Southern culture, being unable to partake due to the limitations of a diabetic diet can have additional mental and emotional effects on people with diabetes. Working with families and dietitians to create a norm of healthily prepared food at social events can minimize the separation individuals may feel from their families and communities while living with diabetes. Also increasing physical activity among families, friends, and other social networks can help improve morale and strengthen bonds between people with diabetes and their peers. In the same vein, providing education and information for families and friends to help them understand the importance of diabetes and how to best offer support can aid in offsetting any of the negative emotional effects individuals with diabetes may experience. Organizing events for those with diabetes, and their families and friends, may help to promote interaction with others in similar situations and to grow a community around them. Support groups can work in the same

[131] The link between depression and diabetes: the search for shared mechanisms. Calum D Moulton, John C Pickup, Khalida Ismail. *The Lancet Diabetes & Endocrinology*, Vol. 3, No. 6, p461–471

[132] Constructs of depression and distress in diabetes: time for an appraisal. Frank J Snoek, Marijke A Bremmer, Norbert Hermanns. *The Lancet Diabetes & Endocrinology*, Vol. 3, No. 6, p450–460

[133] For more on the Social Ecological Model in relation to healthy eating, see http://health.gov/dietaryguidelines/2015/guidelines/chapter-3/social-ecological-model/

fashion to help promote healthy lifestyles for everyone.

MMC encourages communities to take steps in preventing diabetes such as increasing collaborations between community organizations. Many towns have cultivated community gardens that can be used to grow healthy food that can be provided to those in need and can be used as a tool to teach healthy food preparation and the staples of a healthy diet. Community gardens also serve as bonding agents bringing together those of different backgrounds and helping to bridge generational and cultural gaps. Communities also may think critically about current transportation systems and find ways to enhance them in order to help provide easier access to care especially in rural areas. Additionally, communities may encourage non-traditional health care providers, such as community volunteers, to facilitate programs for diabetes management.

As a recipient of a grant from the U.S. Department of Agriculture, TDH also operates the Farmers' Market Nutrition Program (FMNP). Operating in summer months, this program enables low-income families to purchase locally grown fruits, vegetables, and herbs. The program helps to improve nutrition of WIC recipients and the elderly by making Tennessee-grown healthy foods available and providing nutrition education in an effort to prevent chronic diseases such as obesity, diabetes, and related illnesses. This program is currently available in specific counties across the state.[134]

TDH offers Project Diabetes, a statewide initiative that funds competitive, innovative primary prevention projects geared towards obesity and preventing or delaying the onset of Type 2 diabetes in Tennessee.[135] TDH also offers diabetes management resources online including healthy recipes, exercise plans, recommended steps to take to stay healthy, and tips for self-management.[136] There is also an online resource where anyone can reach out to a Registered Dietitian with questions.[137]

TDMHSAS offers the Peer Wellness Initiative, offering one-on-one wellness coaching to help maintain mental and physical health while managing chronic health conditions.[138]

For more information on how to prevent diabetes in your community, see Appendix D.

[134] For more on Tennessee's Farmers Market Nutrition Program, see http://tn.gov/health/topic/MCH-farmers
[135] For more on Project Diabetes, see http://tn.gov/health/article/project-diabetes
[136] For more on TDH's weight management resources, visit: http://tn.gov/health/topic/MCH-nutrition
[137] Access the Ask a Dietitian form here: http://tn.gov/health/article/MCH-nutrition-dietitian
[138] For more on the Peer Wellness Initiative, visit: https://tn.gov/behavioral-health/article/Peer-Wellness-Initiative

Obesity (University of Memphis)

Overview

Obesity represents a major health threat to the nation contributing to the onset of chronic diseases such as Type 2 diabetes, hypertension, cardiovascular disease, stroke, and certain cancers. According to the CDC, over two-thirds of adults in the United States are overweight or obese (BMI > 25). Tennessee exceeds the national average, with nearly 70% of adults overweight or obese. Similarly, Tennessee's 40% obesity rate (BMI $\geq$ 30) among adults exceeds that of the U.S. (35%). Rates of childhood obesity follow the same pattern, with nearly one-third of U.S. children that are (31.8%) overweight or obese, compared to 39% for children in Tennessee. [139]

At the national level, there are disparities in obesity across different groups. According to the CDC, non-Hispanic blacks have the highest rates of obesity (47.8%) followed by Hispanics (42.5%), non-Hispanic whites (32.6%), and non-Hispanic Asians (10.8%). Additionally, obesity is higher among middle age adults that are 40-59 years old (39.5%) than among younger adults aged 20-39 (30.3%) or adults over 60 years old (35.4%).[140]

When it comes to socioeconomic health determinants, those with higher incomes are more likely to have obesity than those with low income specifically among non-Hispanic black and Mexican-American men. Higher-income women are less likely to have obesity than low-income women. There is no significant relationship between obesity and education among men. Among women, however, there is a trend—those with college degrees are less likely to have obesity compared with less-educated women. [141]

From 1990 to 2011, the percent of Tennessee's adults who are obese rose from 11.8% to 31.7%. Since 2011, Tennessee's obesity rates are largely unchanged and continue to be among some of the highest in the nation.[142] Obesity is of particular concern in rural areas, where prevalence is markedly higher than in urban and suburban areas. This disparity may stem from cultural factors, as well as a lack of access to preventive care, obesity education, healthy foods, and convenient areas for exercise.[143]

According to the American Psychological Association, obesity is often accompanied by depression and obesity and depression can trigger and influence each other. Women, in particular, are most likely to be affected by the obesity-depression cycle. Binge eating, a behavior associated with obesity among other conditions, is also a symptom of depression. The majority of obese people

[139] For more on adult obesity and related risks, visit: http://www.cdc.gov/obesity/data/adult.html
[140] Rates are age-adjusted.
[141] For more on adult obesity and related risks, visit: http://www.cdc.gov/obesity/data/adult.html
[142] America's Health Rankings http://www.americashealthrankings.org/TN/smoking
[143] Befort, Christie A., Niaman Nazir, and Michael G. Perri. "Prevalence of Obesity Among Adults From Rural and Urban Areas of the United States: Findings From NHANES (2005-2008)." The Journal of Rural Health 28.4 (2012): 392-97. Web. 3 June 2016.

with binge eating problems also have a history of depression.[144] Additionally, many medications used to treat mental health disorders and psychiatric symptoms can cause weight gain, including antidepressants, antipsychotics, and mood stabilizers.[145]

Opportunities and Recommendations

Through the course of their work, the University of Memphis (UM) determined that successfully and effectively preventing obesity in Tennessee will hinge upon: public, private, and community partnerships; local engagement; individual empowerment; and efforts to make healthy choices the easiest choices.

A key theme that arose was the need to provide opportunities for individuals to know their risk levels and self-manage their weight and lifestyle changes. This allows for individual engagement and control throughout the weight management process. Health fairs and expos are convenient venues through which to share this information and educate communities. Additionally, in order to treat those struggling with obesity, it's necessary to screen for obesity earlier and more often. This helps identify individuals at risk and enables the provision of case management and other weight-management services for those who need it.

As mentioned previously, rural areas struggle from obesity at higher rates than their urban counterparts. To make serving rural areas more cost-effective, one option is to share staff, such as educators, coordinators, and public health workers, across counties for greater impact and to pool resources across counties as available. Joint-use agreements between different groups in rural communities present a unique opportunity to use existing infrastructure like schools, churches, and community centers to host and support physical activity in rural communities, which may not have dedicated spaces such as parks, gyms, sidewalks, or greenways.

The built environment, which includes all aspects of the environment that are modified by people, like homes, schools, workplaces, parks, industrial areas, and highways, can also play a significant role in preventing obesity in Tennessee. Built environment strategies to decrease obesity and increase physical activity can include constructing new buildings with easily accessible staircases and conveniently located water fountains. Strategies can also include developing greenways to connect important community and commercial areas. This approach aims to increase the physical activity levels of the community while also increasing foot traffic near local businesses in order to impact both the economic health of the community. Built environment strategies to fight obesity also include creating safe environments for exercise and physical activity, including adding sidewalks to busy roads or policing parks to ensure security.[146]

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[144] For more on the relationship between obesity and depression, visit: http://www.apa.org/helpcenter/obesity.aspx
[145] Obesity and Mental Disorders Medical Psychiatry (2006): Iii-V. Web. http://jama.jamanetwork.com/article.aspx?articleid=203272
[146] Wakefield, Julie. "Fighting Obesity Through the Built Environment." Environ Health Perspect Environmental Health Perspectives 112.11 (2004). Web. 3 June 2016.

The availability and affordability of healthy food is also a necessary component to reducing obesity in Tennessee. The Green Machine is a mobile grocery in Memphis that uses a converted public transportation bus to sell fruits, vegetables, and other healthy foods at a reasonable price point to people living in the city's food deserts.[147] Similar examples of this idea exist in Chattanooga and Nashville as well. Some communities are partnering with grocery stores to provide healthy food carts in convenience stores to make fresh produce available in areas without grocery stores. Many towns also have cultivated community gardens. They use this space not only to grow healthy food to provide to those in need, but also as an educational tool to teach healthy food preparation and the staples of a healthy diet. Community gardens also serve as bonding agents by bringing together those of different backgrounds and helping to bridge generational and cultural gaps.

Schools also provide a venue to provide children with healthy food and dedicated time for physical activity. Many schools are utilizing GoNoodle, a tool that helps teachers and parents get kids active with short interactive activities. All teachers in Tennessee have the opportunity to use GoNoodle free of charge in their classrooms.[148] Tennessee's Coordinated School Health (CSH) works with all of Tennessee's schools and many other partners to promote physical, emotional, and social health through education and to address school health priorities. They offer best practices for school and health integration, as well as success stories of Tennessee schools that are effectively improving health in education. CSH approaches improving health for children in school through: health education; health services; better nutrition; physical education; cultivating healthy school environments; school counseling; psychological and social services; student, family and community involvement; and school staff wellness. [149]

In combatting obesity, TDH offers Project Diabetes, a statewide initiative that funds competitive, innovative primary prevention projects geared towards obesity and preventing or delaying the onset of Type 2 diabetes in Tennessee.[150] The programs helps groups decrease the prevalence of overweight/obesity across the state by educating the public about health issues linked to obesity. The initiative promotes community, public-private partnerships to tackle obesity and related health problems. The program is also a resource to aid in evaluations to determine effectiveness of overweight and obesity improvement plans and it helps disseminate best practice information for obesity prevention.

[147] The U.S. Department of Agriculture defines food deserts as parts of the country lacking fresh fruit, vegetables, and other healthful whole foods, usually found in impoverished areas. This is largely due to a lack of grocery stores, farmers' markets, and healthy food providers. http://www.ers.usda.gov/dataFiles/Food_Access_Research_Atlas/Download_the_Data/Archived_Version/archived_documentation.pdf

[148] For more information on GoNoodle, see https://www.gonoodle.com/

[149] For more information on Coordinated School Health, see http://www.tennessee.gov/education/topic/coordinated-school-health

[150] For more on Project Diabetes, see http://tn.gov/health/article/project-diabetes

TDH also operates the Farmers' Market Nutrition Program (FMNP), thanks to grants from the U.S. Department of Agriculture. This program, offered in July and August, provides locally grown fruits, vegetables, and herbs to families with limited resources. The FMNP helps improve the nutrition of WIC families and senior citizens by providing Tennessee-grown healthy foods and nutrition education in efforts to prevent chronic diseases such as obesity and diabetes. This program is currently available in specific counties across the state.[151]

In addition, TDH provides toolkits to aid in the development of community and school-based run clubs. Typically geared towards youth, run clubs provide opportunities for physical activity in a supportive group setting organized by coaches and mentors. Currently, twelve Tennessee State Parks sponsor run clubs and work with local schools and surrounding counties.[152]

Weight management resources are offered online by TDH. These resources include healthy recipes, exercise plans, and tips for maintaining healthy weight.[153] This includes an online resource where anyone can reach out to a Registered Dietitian with questions. [154]

FHW provides PPI modules targeted to prevent obesity, among other issues.[155] These modules are learning and teaching tools which may help to address certain root factors effecting obesity. The PPI website also includes references to PPI Bright Spots, which are successful and innovative community projects that have been deemed best practices, and can be easily replicated.[156]

For more information on how to fight obesity in your community, see Appendix D.

[151] For more on Tennessee's Farmers Market Nutrition Program, see http://tn.gov/health/topic/MCH-farmers
[152] For more information on Run Clubs, visit: http://tn.gov/health/topic/run-clubs
[153] For more on TDH's weight management resources, visit: http://tn.gov/health/topic/MCH-nutrition
[154] Access the Ask a Dietitian form here: http://tn.gov/health/article/MCH-nutrition-dietitian
[155] For more on FHW's Primary Prevention Initiative Modules, visit: https://www.tn.gov/health/article/FHW-ppi-modules
[156] For more on PPI's Bright Spots, visit: http://tn.gov/health/article/FHW-ppi-brightspots

Future of Health in Tennessee

The recommendations and opportunities outlined in the preceding five sections are the product of a significant effort on the part of the TDH's academic partners throughout the course of the SIM project. This work on the prevention of five of the top health issues that Tennesseans face was completed to provide guidance to individuals, groups, and organizations in their attempts to improve population health across the state. However, the State Population Health Improvement Plan developed as part of the SIM project provides only a single piece of the puzzle that makes up the overall picture of health in Tennessee.

Together, with Governor Haslam's Tennessee Health Care Innovation Initiative, TennCare's SIM work to design and implement contemporary payment and care delivery models, and the support and partnership of stakeholders and the public, this State Population Health Improvement Plan opens new doors through which the state can travel as it continues to improve health through innovation.

As TDH continues to refine this new framework and generate a more robust repository of best practices, the state will seek to partner with providers, payers, health care delivery systems, community organizations, and others to endorse the State Health Plan in whole or in part. This endorsement will provide an opportunity for TDH to acknowledge the parties helping the state to reach specific goals and outcomes, developing and implementing programs, policies and interventions to prevent the onset of these chronic health issues, and furthering the message of the State Health Plan. If you are interested in endorsing the State Health Plan, please contact a representative of the Division of Health Planning.[157]

[157] To contact Health Planning, visit: http://tn.gov/health/topic/health-planning

Certificate of Need Standards

A certificate of need (CON) is a permit for the establishment or modification of a health care institution, facility, or service at a designated location. Tennessee's CON program seeks to deliver improvements in access, quality, and cost savings through orderly growth management of the state's health care system.

In the 1970's the federal government urged states to control rising health care costs by managing the growth of health care services and facilities through the use of health planning. In response, the Tennessee General Assembly created the state's CON program in 1973. The Health Services Development Agency (HSDA) was established as part of the Health Services Planning Act of 2002. The HSDA serves as an independent agency that reviews CON applications and votes to either approve or deny the request. The Division of Health Planning was established under Tennessee law in 2004 and is statutorily charged with developing and revising the Standards and Criteria that guide the HSDA review and decision making process.[158]

Prior to July 1, 2016, a CON was required for hospitals making facility expansions that exceeded $5 million and non-hospitals making facility expansions that exceeded $2 million. Also, the acquisition of any piece of medical equipment that excedeed $2 million required a CON. Numerous cases of the transfer of beds or changes in the location of exisiting services also required a CON. The following facilities, equipment, and services were regulated by the CON program:

Table 6 – Facilities, Equipment, and Services Previously Regulated by CON

CON Provisions	
• Nursing home • Extracorporeal lithotripsy • Swing bed • PET • Acute care bed • MRI • Inpatient rehabilitation • Linear accelerator • Hospital • Home health services • Neonatal intensive care unit • Residential hospice • Burn units • Hospice	• Discontinuance of obstetrical services • Open heart surgery • Nursing home beds • Cardiac catheterization • Modification of health care institutions • ASTC • Psychiatric inpatient • Outpatient diagnostic center • ICF/IID • Birthing center • Hospital-based alcohol and drug treatment programs lasting longer than 28 days for adolscents • Mental health hospital • Substition-based treatment center for opiate addiction

[158] For more information visit: http://tn.gov/health/article/certificate-of-need or https://www.tn.gov/hsda/topic/certificate-of-need-basics

Changes to the Certificate of Need Program

Public Chapter 1043 became effective July 1, 2016. This law made sweeping changes to the state's Certificate of Need Program including additions and deletions to services overseen by the program, a new emphasis on the quality of health care provided by the applicant, increasing the oversight of granted CONs by the HSDA, and changes in the funding structure of the agency. Table 7 outlines key changes to the facilities, equipment, and services regulated by the CON program.

Table 7 – Summary of CON Changes

Provisions Deleted	Provisions Added	Provisions Changed
• Major medical equipment • Birthing center • Extracorporeal lithotripsy • Swing beds • Rehabilitation services • Hospital-based alcohol and drug treatment programs lasting longer than 28 days for adolscents • Discontinuation of OB services • Closure of a Critical Access Hospital or elimination of a CON required service • Capital expenditure thresholds pertaining to the modification of a healthcare institution	• Organ transplantation • Satellite emergency department	• In counties with a population of more than 250,000 a CON is only required for the initiation of MRI to pediatric patients • In counties with a population of less than 250,000 a CON is required for the initiation of MRI and/or to increase the number of MRI units • 10% of licensed beds in a bed category* can be added without a CON once every three years

*Bed categories: Acute (Includes medical and/or surgical, obstetrics and/or gynecology, ICU/CCU, NICU, pediatric)

The law also makes changes to the responsibilities of the HSDA and the funding structure of the agency. Applications have been reviewed under the guidance of three overarching criteria: 1) Criteria of need, 2) Orderly development of health care, and 3) Economic feasibility of the applicant. The HSDA is now required to consider a fourth criterion regarding appropriate quality

standards.

Additionally, the HSDA has been charged with the continued oversight of granted CONs. The Agency, in consultation with the Division of Health Planning, the Board for Licensing Health Care Facilities within TDH, and the Tennessee Department of Mental Health and Substance Abuse Services (TDMHSAS) must develop measures for assessing the quality of entities that receive a CON. If the agency determines an entity has failed to meet the quality measures, penalties or the revocation of the CON may be imposed.

Finally, the HSDA is now required to be fiscally self-supporting. The agency has the authority to adjust fees associated with the cost of applying for CON in order to fund its operating costs. Unsuccessful applicants are now eligible for a 25 percent refund of their application fee, and a party challenging a CON decision must pay an appeal fee that is equal to 25 percent of the original application fee.

Each edition of the State Health Plan has included revisions to CON Standards and Criteria. All current CON standards, including those previously revised, can be found at the following link: https://www.tn.gov/hsda/. The revision or development of Standards includes a comprehensive process that engages the public, industry stakeholders, and HSDA staff and board members.

The 2015 Edition of the State Health Plan includes revisions to the CON Standards and Criteria for Neonatal Intensive Care Units and Psychiatric Inpatient Services. Also included are newly developed standards for Freestanding Emergency Departments and Organ Transplantation Services. The new revisions replace the versions found in the “Guidelines for Growth” of the HSDA. As required by statute, these revisions and the entire 2015 Edition of the State Health Plan have been reviewed by the agency members and staff.

STATE OF TENNESSEE

STATE HEALTH PLAN

CERTIFICATE OF NEED STANDARDS AND CRITERIA

FOR

Neonatal Intensive Care Units

The Health Services and Development Agency (HSDA) may consider the following standards and criteria for applicants seeking to provide neonatal intensive care unit services. Rationale statements are provided for standards to explain the Division of Health Planning's underlying reasoning. Additionally, these rationale statements may assist stakeholders in responding to these Standards and may assist the HSDA in its assessment of applicants. Existing providers of neonatal nursery services are not affected by these Standards and Criteria unless they take action that requires a new certificate of need (CON) for such services.

These Standards and Criteria are effective immediately upon approval and adoption by the Governor. However, applications to provide neonatal intensive care unit services that are deemed complete by the HSDA prior to the approval and adoption of these Standards and Criteria shall be considered under the Guidelines for Growth, 2000 Edition.

The Certificate of Need Standards and Criteria serve to uphold the Five Principles for Achieving Better Health set forth by the State Health Plan. Utilizing the Five Principles for Achieving Better Health during the development of the CON Standards and Criteria ensures the protection and promotion of the health of the people of Tennessee. The State Health Plan's Five Principles for Achieving Better Health are as follows:

1. **Healthy Lives:** The purpose of the State Health Plan is to improve the health of people in Tennessee.
2. **Access:** People in Tennessee should have access to health care and the conditions to achieve optimal health.
3. **Economic Efficiencies:** Health resources in Tennessee, including health care, should be

developed to address the health of people in Tennessee while encouraging value and economic efficiencies.

4. **Quality of Care:** People in Tennessee should have confidence that the quality of care is continually monitored and standards are adhered to by providers.
5. **Workforce:** The state should support the development, recruitment, and retention of a sufficient and quality health workforce.

Definitions

Definitions for **Level I, Level II, Level III and Level IV Neonatal Services** can be found in the Tennessee Perinatal Care System Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities. These Standards and Criteria apply to Level II and higher neonatal services.

Neonatologist: A board-certified pediatrician with subspecialty certification in neonatal/perinatal medicine or who is eligible for certification in neonatal/perinatal medicine and is within five years of completion of an accredited fellowship program.

Service Area: Refers to the county or counties represented by an applicant as the reasonable area in which the applicant intends to provide neonatal nursery services and/or in which the majority of its current service recipients reside.

Standards and Criteria

1. **Determination of Need:** The need for neonatal nursery services is based upon data obtained from Tennessee Department of Health Office of Vital Records in order to determine the total number of live births which occurred within the designated service area. The need shall be based upon the current year's population projected for three years forward. The total number of neonatal intensive and intermediate care beds shall not exceed nine beds per 1,000 live births per year in a defined neonatal service area. These estimates represent gross bed need and shall be adjusted by subtracting the existing applicable staffed beds including certified beds in outstanding CONs operating in the area as counted by TDH in the Joint Annual Report (JAR).

   Rationale: The number of beds per 1,000 live births utilized for the determination of need has been changed from eight to nine. Health Planning analyzed data provided by the Department of Health in order to determine if the previous need formula was adequate given current NICU utilization trends. The data show that statewide utilization rates have increased by 1,087 between 2010 and 2014. However, Health Planning believes it is not possible to determine if this increase in utilization is due to an increase in high-risk births or if it is due to overutilization. This position regarding utilization is supported by scholarly research focusing on epidemiologic trends in neonatal intensive care. The current bed

need formula was developed in consultation with the Perinatal Advisory Committee.

Research can be found at the following link:
http://archpedi.jamanetwork.com/article.aspx?articleid=2381545

Wade Harrison and David Goodman, "Epidemiologic Trends in Neonatal Intensive Care, 2007-2012," JAMA Pediatrics, Vol. 169, No. 9, Sept. 2015, pp. 855-862.

2. **Minimum Bed Standard:** A single Level II neonatal special care unit shall contain a minimum of 10 beds. A single Level III neonatal special care unit shall contain a minimum of 15 beds. These numbers are considered to be the minimum ones necessary to support economical operation of these services. An adjustment in the number of beds may be justified due to geographic remoteness.

3. **Establishment of Service Area:** The geographic service area shall be reasonable and based on an optimal balance between population density and service proximity of the applicant.

4. **Access:** The applicant must demonstrate an ability and willingness to serve equally all of the service area in which it seeks certification. In addition to the factors set forth in HSDA Rule 0720-11-.01(1) (listing factors concerning need on which an application may be evaluated), the HSDA may choose to give special consideration to an applicant that is able to show that there is a limited access in the proposed service area.

5. **Orderly Development of Applicant's Neonatal Nursery Services:** The applicant shall document the number of Level II, Level III, and Level IV cases that have been referred out of the hospital during the most recent three year period of available data.

6. **Occupancy Rate Consideration:** The Agency may take into account the following suggested occupancy rates of existing facilities in the service area. The occupancy rates of an existing facility shall be 80 percent or greater in the preceding 12 months to justify expansion. The overall utilization of existing providers in the service area shall be 80 percent or greater for the approval of a new facility in a service area.

7. **Assurance of Resources:** The applicant shall document that it will provide the resources necessary to properly support the applicable level of neonatal nursery services. These resources shall align with those set forth by the Tennessee Perinatal Care System Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities. Included in such documentation shall be a letter of support from the applicant's governing board of directors documenting the full commitment of the applicant to develop and maintain the facility resources, equipment, and staffing to provide a full continuum of neonatal nursery

services. The applicant shall also document the financial costs of maintaining these resources and its ability to sustain them to ensure quality treatment of patients in the neonatal nursery services continuum of care.

8. **Perinatal Advisory Committee.** The Department of Health will consult with the Perinatal Advisory Committee regarding applications.

9. **Adequate Staffing:** An applicant shall document a plan demonstrating the intent and ability to recruit, hire, train, assess competencies of, supervise, and retain the appropriate numbers of qualified personnel to provide the services described in the application and that such personnel are available in the proposed service area. The applicant shall comply with the staffing guidelines and qualifications set forth by the Tennessee Perinatal Care System Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities.

   Rationale: The Division of Health Planning aligned the Criteria and Standards for staffing patterns with the Tennessee Perinatal Care System Guidelines in order to ensure consistency. Additionally, utilizing the work of experts in the field ensures the Standards are stringent and appropriate. This Standard was reviewed and deemed adequate by the Tennessee Perinatal Advisory Committee.

10. **Staff and Service Availability for Emergent Cases:** The applicant shall document the capability to access the neonatologist rapidly for emergency cases 24 hours per day, seven days per week, 365 days per year.

11. **Education:** The applicant shall provide details of its plan to educate physicians, other professional and technical staff, and parents. This plan shall be performed in accordance with the education guidelines set forth by Tennessee Perinatal Care System Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities.

12. **Community Linkage Plan:** The applicant shall describe its participation, if any, in a community linkage plan, including its relationships with appropriate health care system providers/services and working agreements with other related community services assuring continuity of care. The applicant is encouraged to include primary prevention initiatives in the community linkage plan that would address risk factors leading to the increased likelihood of NICU usage.

    Rationale: The 2014 Update to the State Health Plan moved from a primary emphasis of health care to an emphasis on “health protection and promotion”. The development of primary prevention initiatives for the community advances the mission of the current State Health Plan.

13. **Data Requirements**: Applicants shall agree to provide the Department of Health and/or the Health Services and Development Agency with all reasonably requested information and statistical data related to the operation and provision of services and to report that data in the time and format requested. As a standard practice, existing data reporting streams will be relied upon and adapted over time to collect all needed information.

14. **Quality Control and Monitoring:** The applicant shall identify and document its existing or proposed plan for data reporting, quality improvement, and outcome and process monitoring system.

    Rationale: This section supports the State Health Plan's Fourth Principle for Achieving Better Health regarding quality of care.

15. **Tennessee Initiative for Perinatal Quality Care (TIPQC):** The applicant is encouraged to include a description of its plan to participate in the TIPQC.

    Rationale: This Standard was developed under the guidance of the Perinatal Advisory Committee.

STATE OF TENNESSEE

STATE HEALTH PLAN

CERTIFICATE OF NEED STANDARDS AND CRITERIA

FOR

Psychiatric Inpatient Services

The Health Services and Development Agency (HSDA) may consider the following standards and criteria for applications seeking to provide psychiatric inpatient services. Rationale statements are provided for standards to explain the Division of Health Planning's (Division) underlying reasoning and are meant to assist stakeholders in responding to these Standards and to assist the HSDA in its assessment of certificate of need (CON) applications. Existing providers of psychiatric inpatient services are not affected by these Standards and Criteria unless they take an action that requires a new CON for such services.

These Standards and Criteria are effective immediately upon approval and adoption by the Governor. However, applications to provide psychiatric inpatient services that are deemed complete by the HSDA prior to the approval and adoption of these Standards and Criteria shall be considered under the Guidelines for Growth, 2000 Edition.

The Certificate of Need Standards and Criteria serve to uphold the Five Principles for Achieving Better Health set forth by the State Health Plan. Utilizing the Five Principles for Achieving Better Health during the development of the CON Standards and Criteria ensures the protection and promotion of the health of the people of Tennessee. The State Health Plan's Five Principles for Achieving Better Health are as follows:

1. **Healthy Lives:** The purpose of the State Health Plan is to improve the health of people in Tennessee.
2. **Access:** People in Tennessee should have access to health care and the conditions to achieve optimal health.
3. **Economic Efficiencies:** Health resources in Tennessee, including health care, should be developed to address the health of people in Tennessee while encouraging value and economic efficiencies.
4. **Quality of Care:** People in Tennessee should have confidence that the quality of care is continually monitored and standards are adhered to by providers.
5. **Workforce:** The state should support the development, recruitment, and retention of a sufficient and quality health workforce.

Definitions

Psychiatric inpatient services: Shall mean the provision of psychiatric and substance services to persons with a mental illness, serious emotional disturbance (children), or substance use diagnosis in a hospital setting, as defined in TCA 33-1-101(14); residential treatment services and crisis stabilization unit services are not included in this definition.

Service Area: The county or counties represented on an application as the reasonable area in which a psychiatric inpatient facility intends to provide services and/or in which the majority of its service recipients reside.

Medical Detox: The intensive 24 hour treatment for service recipients to systematically reduce or eliminate the amount of a toxic agent in the body until the signs and symptoms of withdrawal are resolved. Medical detoxification treatment requires medical and professional nursing services to manage withdrawal signs and symptoms.

This definition applies to general hospital beds, licensed by the Tennessee Department of Health (TDH), in a unit that provides psychiatric treatment services and/or substance use treatment services. These services are provided both while the patient is detoxed and after detox has occurred.

This definition applies to mental health hospital beds, licensed by the Tennessee Department of Mental Health and Substance Abuse Services (TDMHSAS), in a unit that provides psychiatric treatment services and/or substance use treatment services. These services are provided both while the patient is detoxed and after detox has occurred.

Standards and Criteria

1. **Determination of Need:** The population-based estimate of the total need for psychiatric inpatient services is a guideline of 30 beds per 100,000 general population, using population estimates prepared by the TDH and applying the applicable data in the Joint Annual Report (JAR). These estimates represent gross bed need and shall be adjusted by subtracting the existing applicable staffed beds including certified beds in outstanding CONs operating in the area as counted by the TDH in the JAR. For adult programs, the age group of 18-64 years shall be used in calculating the estimated total number of beds needed; additionally, if an applicant proposes a geriatric psychiatric unit, the age range 65+ shall be used. For child inpatients, the age group is 12 and under, and if the program is for adolescents, the age group of 13-17 shall be used. The HSDA may take into consideration data provided by the applicant justifying the need for additional beds that would exceed the guideline of 30 beds per 100,000 general population. Special consideration may be

given to applicants seeking to serve child, adolescent, and geriatric inpatients. Applicants may demonstrate limited access to services for these specific age groups that supports exceeding the guideline of 30 beds per 100,000 general population. An applicant seeking to exceed this guideline shall utilize TDH and TDMHSAS data to justify this projected need and support the request by addressing the factors listed under the criteria "Additional Factors".

Rationale: Many communities in Tennessee have unique needs for inpatient psychiatric beds. The above formula functions as a "base criteria" that allows applicants to provide evidence supporting a need for a higher number of beds in the proposed service area. The HSDA may take into account all evidence provided and approve applications that request beds that exceed the 30 beds per 100,000 guideline when needed. An analysis of admissions and discharges by age category performed by the HSDA suggests there may be limited access for inpatients under the age of 18 and inpatients aged 65 and over. However, the applicable JAR form does not provide occupancy rates by age category. Health Planning believes developing determination of need formulas specific to each age category is not possible at this time due to these limitations in available data. The current need formula is to be utilized as a guideline allowing applicants the opportunity to apply to serve the unique needs of the intended service area.

2. **Additional Factors:** An applicant shall address the following factors:
    a. The willingness of the applicant to accept emergency involuntary and non-emergency indefinite admissions;
    b. The extent to which the applicant serves or proposes to serve the TennCare population and the indigent population;
    c. The number of beds designated as "specialty" beds (including units established to treat patients with specific diagnoses);
    d. The ability of the applicant to provide a continuum of care such as outpatient, intensive outpatient treatment (IOP), partial hospitalization, or refer to providers that do;
    e. Psychiatric units for patients with intellectual disabilities;
    f. Free standing psychiatric facility transfer agreements with medical inpatient facilities;
    g. The willingness of the provider to provide inpatient psychiatric services to all populations (including those requiring hospitalization on an involuntary basis, individuals with co-occurring substance use disorders, and patients with comorbid medical conditions); and
    h. The applicant shall detail how the treatment program and staffing patterns align with the treatment needs of the patients in accordance with the expected length of stay of the patient population.
    i. Special consideration shall be given to an inpatient provider that has been specially contracted by the TDMHSAS to provide services to uninsured patients in a region

that would have previously been served by a state operated mental health hospital that has closed.

j. Special consideration shall be given to a service area that does not have a crisis stabilization unit available as an alternative to inpatient psychiatric care.

3. **Incidence and Prevalence:** The applicant shall provide information on the rate of incidence and prevalence of mental illness and substance use within the proposed service area in comparison to the statewide rate. Data from the TDMHSAS or the Substance Abuse and Mental Health Services Administration (SAMHSA) shall be utilized to determine the rate. This comparison may be used by the HSDA staff in review of the application as verification of need in the proposed service area.

   Rationale: The rate of incidence and prevalence of mental illness in the service area may indicate a need for a higher number of psychiatric inpatient beds in the designated area.

4. **Planning Horizon:** The applicant shall predict the need for psychiatric inpatient beds for the proposed first two years of operation.

   Rationale: The Division believes that projecting need two years into the future is more likely to accurately reflect the coming trends and less likely to overstate potential future need.

5. **Establishment of Service Area:** The geographic service area shall be reasonable and based on an optimal balance between population density and service proximity of the applicant. The socio-demographics of the service area and the projected population to receive services shall be considered. The proposal's sensitivity and responsiveness to the special needs of the service area shall be considered, including accessibility to consumers, particularly women, racial and ethnic minorities, low income groups, other medically underserved populations, and those who need services involuntarily. The applicant may also include information on patient origination and geography and transportation lines that may inform the determination of need for additional services in the region.

   Applicants should be aware of the Bureau of TennCare's access requirement table, found under "Access to Behavioral Health Services" on pages 93-94 at http://www.tn.gov/assets/entities/tenncare/attachments/operationalprotocol.pdf.

   Rationale: In many cases it is likely that a proposed psychiatric facility's service area could draw more significantly from only a portion of a county. When available, the Division would encourage the use of sub-county level data that are available to the general public (including utilization, demographic, etc.) to better inform the HSDA in making its decisions. Because psychiatric patients often select a facility based on the proximity of caregivers and

family members, as well as the proximity of the facility, factors other than travel time may be considered by the HSDA. Additionally, geography and transportation lines may limit access to services and necessitate the availability of additional psychiatric inpatient beds in specific service areas.

6. **Composition of Services:** Inpatient hospital services that provide only substance use services shall be considered separately from psychiatric services in a CON application; inpatient hospital services that address co-occurring substance use/mental health needs shall be considered collectively with psychiatric services. Providers shall also take into account concerns of special populations (including, e.g., supervision of adolescents, specialized geriatric, and patients with comorbid medical conditions).

   The composition of population served, mix of populations, and charity care are often affected by status of insurance, TennCare, Medicare, or TriCare; additionally, some facilities are eligible for Disproportionate Share Hospital payments based on the amount of charity care provided, while others are not. Such considerations may also result in a prescribed length of stay.

   Rationale: Because patients with psychiatric conditions often experience co-morbid conditions, it is important that providers be capable of addressing such patients' potential medical needs. The accessibility of psychiatric services to various populations and for appropriate lengths of stay are important considerations for the HSDA when reviewing psychiatric inpatient services applications.

7. **Patient Age Categorization:** Patients should generally be categorized as children (0-12), adolescents (13-17), adults (18-64), or geriatrics (65+). While an adult inpatient psychiatric service can appropriately serve adults of any age, an applicant shall indicate if they plan to only serve a portion of the adult population so that the determination of need may be based on that age-limited population. Applicants shall be clear regarding the age range they intend to serve; given the small number of hospitals who serve younger children (12 and under), special consideration shall be given to applicants serving this age group. Applicants shall specify how patient care will be specialized in order to appropriately care for the chosen patient category.

   Rationale: Based on stakeholder input, the Division has categorized the patient population into children, adolescents, adults, and geriatric. Each age category may require unique care.

8. **Services to High-Need Populations:** Special consideration shall be given to applicants providing services fulfilling the unique needs and requirements of certain high-need populations, including patients who are involuntarily committed, uninsured, or low-income.

9. **Relationship to Existing Applicable Plans; Underserved Area and Populations:** The proposal's relationships to underserved geographic areas and underserved population groups shall also be a significant consideration. The impact of the proposal on similar services in the community supported by state appropriations shall be assessed and considered; the applicant's proposal as to whether or not the facility takes voluntary and/or involuntary admissions, and whether the facility serves acute and/or long-term patients, shall also be assessed and considered. The degree of projected financial participation in the Medicare and TennCare programs shall be considered.

   Relationship to Existing Similar Services in the Area: The proposal shall discuss what similar services are available in the service area and the trends in occupancy and utilization of those services. This discussion shall also include how the applicant's services may differ from existing services (e.g., specialized treatment of an age-limited group, acceptance of involuntary admissions, and differentiation by payor mix). Accessibility to specific special need groups shall also be discussed in the application.

   Rationale: Based on stakeholder input, a number of factors, including occupancy, shall be considered in the context of general utilization trends. Additionally, several factors may be necessary to consider when determining occupancy including staffed beds verses licensed beds, the target patient population, and the operation of specialty units.

10. **Expansion of Established Facility:** Applicants seeking to add beds to an existing facility shall provide documentation detailing the sustainability of the existing facility. This documentation shall include financials, and utilization rates. A facility seeking approval for expansion should have maintained an occupancy rate for all licensed beds of at least 80 percent for the previous year. The HSDA may take into consideration evidence provided by the applicant supporting the need for the expansion or addition of services without the applicant meeting the 80 percent threshold. Additionally, the applicant shall provide evidence that the existing facility was built and operates, in terms of plans, service area, and populations served, in accordance with the original project proposal.

    Rationale: Based on stakeholder input, the implementation of an 80 percent threshold for the approval may serve as an indicator of economic feasibility for the expansion of the facility. The 80 percent occupancy requirement may limit an applicant's ability to add specialty services that require separation from other units. Examples include geriatric psychiatry, services for patients with co-occurring mental health needs and substance use disorders. Additionally, the majority of the programs in the state are currently operating under this threshold. The communities these programs serve may have needs that require an expansion of services. An applicant may provide evidence of the economic feasibility of expansion despite not operating at or above 80 percent of capacity.

11. **Licensure and Quality Considerations:** Any existing applicant for this CON service category shall be in compliance with the appropriate rules of the TDH and/or the TDMHSAS. The applicant shall also demonstrate its accreditation status with the Joint Commission, the Commission on Accreditation of Rehabilitation Facilities (CARF), or other applicable accrediting agency. Such compliance shall provide assurances that applicants are making appropriate accommodations for patients (e.g., for seclusion/restraint of patients who present management problems, and children who need quiet space). Applicants shall also make appropriate accommodations so that patients are separated by gender in regards to sleeping as well as bathing arrangements. Additionally, the applicant shall indicate how it would provide culturally competent services in the service area (e.g., for veterans, the Hispanic population, and LBGT population).

12. **Institution for Mental Disease Classification:** It shall also be taken into consideration whether the facility is or will be classified as an Institution for Mental Disease (IMD). The criteria and formula involve not just the total number of beds, but the average daily census (ADC) of the inpatient psychiatric beds in relation to the ADC of the facility. When a facility is classified as an IMD, the cost of patient care for Bureau of TennCare enrollees aged 21-64 will be reimbursed using 100 percent state funds, with no matching federal funds provided; consequently, this potential impact shall be addressed in any CON application for inpatient psychiatric beds.

13. **Continuum of Care:** Free standing inpatient psychiatric facilities typically provide only basic acute medical care following admission. This practice has been reinforced by Tenn. Code Ann. § 33-4-104, which requires treatment at a hospital or by a physician for a physical disorder prior to admission if the disorder requires immediate medical care and the admitting facility cannot appropriately provide the medical care. It is essential, whether prior to admission or during admission, that a process be in place to provide for or to allow referral for appropriate and adequate medical care. However, it is not effective, appropriate, or efficient to provide the complete array of medical services in an inpatient psychiatric setting.

14. **Data Usage:** The TDH and the TDMHSAS data on the current supply and utilization of licensed and CON-approved psychiatric inpatient beds shall be the data sources employed hereunder, unless otherwise noted. The TDMHSAS and the TDH Division of Health Licensure and Regulation have data on the current number of licensed beds. The applicable TDH JAR provides data on the number of beds in operation. Applicants should utilize data from both sources in order to provide an accurate bed inventory.

    Rationale: Using these sources for data is the only way to ensure consistency across the evaluation of all applications. Data provided by the TDH and the TDMHSAS shall be relied

upon as the primary sources of data for CON psychiatric inpatient services applications. Each data source has specific caveats. Requiring the use of both licensed beds and operating beds will provide a more comprehensive bed inventory analysis.

15. **Adequate Staffing:** An applicant shall document a plan demonstrating the intent and ability to recruit, hire, train, assess competencies of, supervise, and retain the appropriate numbers of qualified personnel to provide the services described in the application and that such personnel are available in the proposed Service Area. Each applicant shall outline planned staffing patterns including the number and type of physicians. Additionally, the applicant shall address what kinds of shifts are intended to be utilized (e.g., 8 hour, 12 hour, or Baylor plan). Each unit is required to be staffed with at least two direct patient care staff, one of which shall be a nurse, at all times. This staffing level is the minimum necessary to provide safe care. The applicant shall state how the proposed staffing plan will lead to quality care of the patient population served by the project.

    However, when considering applications for expansions of existing facilities, the HSDA may determine whether the existing facility's staff would continue without significant change and thus would be sufficient to meet this standard without a demonstration of efforts to recruit new staff.

16. **Community Linkage Plan:** The applicant shall describe its participation, if any, in a community linkage plan, including its relationships with appropriate health care system providers/services and working agreements with other related community services assuring continuity of care (e.g., agreements between freestanding psychiatric facilities and acute care hospitals, linkages with providers of outpatient, intensive outpatient, and/or partial hospitalization services). If they are provided, letters from providers (e.g., physicians, mobile crisis teams, and/or managed care organizations) in support of an application shall detail specific instances of unmet need for psychiatric inpatient services. The applicant is encouraged to include primary prevention initiatives in the community linkage plan that would address risk factors leading to the increased likelihood of Inpatient Psychiatric Bed usage.

    Rationale: The Division recognizes that participation in community linkage plans is an important element in the provision of quality psychiatric inpatient services; therefore, it is important for applicants to demonstrate such connections with other community providers. The 2014 update to the State Health Plan moved from a primary emphasis of health care to an emphasis on "health protection and promotion". The development of primary prevention initiatives for the community advances the mission of the State Health Plan.

17. **Access:** The applicant must demonstrate an ability and willingness to serve equally all of

the patients related to the application of the service area in which it seeks certification. In addition to the factors set forth in HSDA Rule 0720-11-.01(1) (listing the factors concerning need on which an application may be evaluated), the HSDA may choose to give special consideration to an applicant that is able to show that there is limited access in the proposed service area.

18. **Quality Control and Monitoring:** The applicant shall identify and document its existing or proposed plan for data reporting, quality improvement, and outcome and process monitoring system. An applicant that owns or administers other psychiatric facilities shall provide information on their surveys and their quality improvement programs at those facilities, whether they are located in Tennessee or not.

    Rationale: This section supports the State Health Plan's Fourth Principle for Achieving Better Health regarding quality of care.

19. **Data Requirements:** Applicants shall agree to provide the TDH, the TDMHSAS, and/or the HSDA with all reasonably requested information and statistical data related to the operation and provision of services at the applicant's facility and to report that data in the time and format requested. As a standard of practice, existing data reporting streams will be relied upon and adapted over time to collect all needed information.

Appendices & Exhibits

Appendix A: Statutory Authority for the State Health Plan

The Division of Health Planning was created by action of the Tennessee General Assembly and signed in to law by Governor Phil Bredesen (Tennessee Code Annotated § 68-11-1625). The Division is charged with creating and updating a State Health Plan. The text of the law follows.

a) There is created the state health planning division of the department of finance and administration. It is the purpose of the planning division to create a state health plan that is evaluated and updated at least annually. The plan shall guide the state in the development of health care programs and policies and in the allocation of health care resources in the state.

b) It is the policy of the state of Tennessee that:
   1. Every citizen should have reasonable access to emergency and primary care;
   2. The state's health care resources should be developed to address the needs of Tennesseans while encouraging competitive markets, economic efficiencies and the continued development of the state's health care industry;
   3. Every citizen should have confidence that the quality of health care is continually monitored and standards are adhered to by health care providers; and
   4. The state should support the recruitment and retention of a sufficient and quality health care workforce.

c) The planning division shall be staffed administratively by the department of finance and administration in a manner that the department deems necessary for the performance of the planning division's duties and responsibilities, which may include contracting for the services provided by the division through a private person or entity.

d) The duties and responsibilities of the planning division include:
   1. To develop and adopt a State Health Plan, which must include, at a minimum, guidance regarding allocation of the state's health care resources;
   2. To submit the State Health Plan to the Health Services and Development Agency for comment;
   3. To submit the State Health Plan to the Governor for approval and adoption;
   4. To hold public hearings as needed;
   5. To review and evaluate the State Health Plan at least annually;
   6. To respond to requests for comment and recommendations for health care policies and programs;

7. To conduct an ongoing evaluation of Tennessee's resources for accessibility, including, but not limited to, financial, geographic, cultural, and quality of care;
8. To review the health status of Tennesseans as presented annually to the Division by the Department of Health and the Department of Mental Health and Developmental Disabilities;
9. To review and comment on federal laws and regulations that influence the health care industry and the health care needs of Tennesseans;
10. To involve and coordinate functions with such State entities as necessary to ensure the coordination of State health policies and programs;
11. To prepare an annual report for the General Assembly and recommend legislation for its consideration and study; and
12. To establish a process for timely modification of the State Health Plan in response to changes in technology, reimbursement and other developments that affect the delivery of health care.

Appendix B: State Innovation Model All-Schools Meeting Materials

Below are excerpts from the informational packet provided to all attendees of the SIM All-Schools Meeting on March 3-4, 2016 at Meharry Medical College in Nashville, TN. This includes the expectations for participation, conference agenda, associated worksheets used by participants throughout both the general discussion and breakouts, as well as the themes from the breakout discussions and questions used in the closing discussion. The themes from the breakout discussions were shared at the beginning of the closing discussion. The audience was then asked additional questions to validate and build upon these themes.

Expectations for Participation

General

Thank you for attending our SIM All Schools Meeting. You are here because you are an expert in one of the many areas involved in both the schools' and the Department of Health's SIM work, and your input will be valuable. The goal of this meeting is to discuss how the schools' regional recommendations can be effectively scaled to the statewide level.

As you learn about each school's process, goals, and recommendations, think about how these recommendations could integrate with existing programs, how we can work across divisions or agencies to accomplish these goals, what resources or grants we, or local entities, could leverage, and any challenges you can foresee. Feel free to volunteer this information during discussions or breakouts, but also **please feel free to email your thoughts to Christina Hartlage (Christina.Hartlage@tn.gov).**

As you participate in breakout discussions, please remember that the purpose of this meeting is not to critique the work that has been done, but instead to offer practical discussion on how to elevate this work so that the recommendations can be as effective as possible at the state-wide level. From this meeting, we hope to take away a thorough understanding of what approaches, programs and policies, when implemented statewide, will be most effective at improving population health for perinatal health, child health, tobacco cessation, diabetes, and obesity. At the end of this packet, we have provided five blank worksheets, one for each topic breakout, to help you organize your thoughts and take your own notes throughout the discussion.

NAM Vital Signs

One of the key features of an effective improvement plan is having specific measures to track progress. For the state PHIP, we plan to integrate our evaluative metrics with NAM's Vital Signs core measures. These core measures were developed by the National Academy of Medicine in conjunction with Blue Shield of California, the California Healthcare Foundation, and the Robert Wood Johnson Foundation. They follow a four-domain framework, focusing on healthy people, care quality, lower cost, and engaged people. NAM recommends their application at every level

of health and health care, and across sectors, in order to provide consistent benchmarks for health progress across the nation. You can find more information on the NAM National Academies website (iom.nationalacademies.org/~/media/Files/Report%20Files/2015/Vital_Signs/VitalSigns_RB.pdf).

At the end of this packet, we provide an NAM Vital Signs Worksheet. This worksheet outlines the set of 15 core measures recommended by Vital Signs, and related priority measures. We would like you to keep this in mind as you listen to each school's presentations and recommendations, and to document on the worksheet any ideas you have related to the core or related measures, and how you can see pieces of the regional or state PHIP applying to these areas. **We ask that you turn this into Christina Hartlage, the intern facilitating your Day 2 breakout, or another Health Planning staff member.**

SIM All-Schools Meeting Agenda

Tennessee SIM 2 Population Health Improvement Plan
Cal Turner Family Center for Student Education
1011 21st St. N, Nashville, TN

March 3 – Regional PHIP Presentations Cal Turner Center - Ballroom	
08:30 – 09:00	**Breakfast & Welcome** Jeff Ockerman, Christina Hartlage
09:00 – 10:20	**Perinatal Health, University of Tennessee – Knoxville** Drs. Samantha Ehrlich, Paul Erwin, Laurie Meschke
10:20 – 10:30	**Break**
10:30 – 11:50	**Child Health, Tennessee State University** Drs. Stephanie Bailey, Wendelyn Inman, Kimberlee Wyche-Etheridge
11:50 – 12:30	**Lunch** Served in Ballroom's foyer
12:30 – 01:50	**Obesity, University of Memphis** Dr. Marian Levy, Ms. Kira Reich
01:50 – 02:00	**Break**
02:00 – 03:20	**Diabetes, Meharry Medical College** Dr. William Washington
03:20 – 03:30	**Break**
03:30 – 04:50	**Tobacco Cessation, East Tennessee State University** Drs. Mary Ann Littleton, Hadii Mamudu
04:50 – 05:00	**Wrap Up** Jeff Ockerman, Christina Hartlage Tennessee Department of Health

March 4 – Scalability Breakouts Call Turner Center - Ballroom, Breakout Rooms	
08:30 – 08:45	**Overview of the Day** Jeff Ockerman, Christina Hartlage
08:45 – 09:30	**Breakout #1** (Varies by person)
09:30 – 10:15	**Breakout #2** (Varies by person)
10:15 – 10:30	**Break**
10:30 – 11:15	**Breakout #3** (Varies by person)
11:15 – 12:00	**Breakout #4** (Varies by person)
12:00 – 01:30	**Lunch & Wrap Up** Served in Ballroom Jeff Ockerman, Christina Hartlage

NAM Vital Signs Worksheet

On the following two pages you will find the NAM Vital Signs Worksheet. This worksheet outlines the set of 15 core measures recommended by Vital Signs, and related priority measures. We would like you to keep this in mind as you listen to each school's presentation and recommendations, and to document on the worksheet any ideas you have related to the core or related measures, and how you can see pieces of the regional or state PHIP applying to these areas. **At the end of the meeting, we ask that you turn this into Christina Hartlage, the intern facilitating your Day 2 breakout, or another Health Planning staff member.**

NAM Vital Signs Worksheet

HEALTHY PEOPLE

Core Measure	Related Priority Measures	Notes/Comments
Life Expectancy	Infant mortality Maternal mortality Violence and injury mortality	
Well-Being	Multiple chronic conditions Depression	
Overweight & Obesity	Activity levels Healthy eating patterns	
Addictive Behavior	Tobacco use Drug dependence/illicit use Alcohol dependence/misuse	
Unintended Pregnancy	Contraceptive use	
Healthy Communities	Childhood poverty rate Childhood asthma Air quality index Drinking water quality index	

QUALITY CARE	**Preventive Services**	Influenza immunization Colorectal cancer screening Breast cancer screening
	Care Access	Usual source of care Delay of needed care
	Patient Safety	Wrong-site surgery Pressure ulcers Medication reconciliation
	Evidence-Based Care	Cardiovascular risk reduction Hypertension control Diabetes control composite Heart attach therapy protocol Stroke therapy protocol Unnecessary care composite
	Care Match with Patient Goals	Patient experience Shared decision making End-of-life/advanced care planning
AFFORDABLE CARE	**Personal Spending Burden**	Health care-related bankruptcies
	Population Spending Burden	Total cost of care Health care spending growth
ENGAGED PEOPLE	**Individual Engagement**	Involvement in health initiatives
	Community Engagement	Availability of health food Walkability Community health benefit agenda

Breakout Worksheets

On the following pages you fill find notetaking worksheets specific to each breakout. These are the same worksheets our facilitators and note takers are using to document the discussion in each breakout, and are in line with the type of content we hope to take away from this meeting. Please feel free to use this format to document your thoughts throughout the meeting, your notes during the breakout discussions, or for any other reason you find helpful. [159]

[159] For the purposes of this document, only one worksheet is included as an example. In the original informational packet, one was included for each health topic breakout attended.

Perinatal Health Breakout

What will work at state level?	What won't work at state level?
Suggestions for how to improve the recommendations so they *will* work at the state level?	

Breakout Discussion Themes

The themes below were gleaned from observations of each of the breakout discussions. These themes were presented to the group at the beginning of the closing discussion.

- Evaluation is key.
  - Consider effectiveness of current programs.
  - Build in evaluation plans for new programs.
- Local engagement in development and implementation is necessary in many areas.
- Partner with the business community.
  - Make sure they understand that they *do* have a vested interest in community health (both workforce and patrons).
- Enforce existing programs.
- Reach parents/family/friends, not just the patient.
- There's a lot of crossover and alignment of goals across health topics.
  - Leverage this to make a bigger impact using fewer, more targeted interventions.
- Use public health as a convener to leverage other resources.
- Would love an easily accessible repository of evidence-based best practices that local communities/departments can use as a starting point.
  - Include both federal, state, and local programs, as well as programs from sister states.
- Frame discussions to incentivize stakeholders appropriately.
  - Focus on cost-savings, or other key topics to get groups on board and engaged.
  - Show them why they, specifically, have a stake in the health of their community in order to get their buy in.
- Empower individuals to make changes themselves.
  - Educate them on small skills for self-management.
  - Teach them to set small, achievable goals to build confidence.
- Research "positive deviancy".
  - Find the people who are deviating from the norm in a positive way.
  - Identify your natural outliers and figure out they're doing so well, and replicate that.
- Address underlying behavioral health problems that may drive these secondary health issues.
- Explore new, unique mediums and approaches for education to reach your population.
  - Focus on positive messaging and building health instead of condemning unhealthy behaviors.
  - Go to people where they are – use the community as it exists already.
- Help people "map the gap" from where they are to where they want to go.

Closing Discussion Questions

After the presentation of the previously listed themes, attendees were asked these questions to build upon the themes as part of the closing discussion.

- What themes did you hear across your breakouts?
- What were some cool, new ideas that you heard?
- What are some practical ways that the State PHIP can engage and support local initiatives?
- What are the key things for us to keep in mind while drafting the State PHIP?
- What is one key takeaway for state-wide scalability?

Appendix C: Public Focus Group Materials

Below are excerpts from the workshop packet provided to all attendees of State Health Plan public focus groups. This includes the schedule of forums, the agenda for each session, as well as the supporting documentation for both group discussion activities.

Public Forum Schedule

City	Location	Date & Time
Knoxville	Knox County Health Department (Auditorium) 140 Dameron Ave, Knoxville, TN 37917	April 20, 2016 1:00-4:00 pm Eastern
Chattanooga	Eastgate Building (Conference Room 2.307) 5600 Brainerd Rd., Chattanooga, TN 37411	April 21, 2016 5:00-8:00 pm Eastern
Clarksville	Montgomery County Health Department 330 Pageant Lane Clarksville, TN 37040	April 26, 2016 9:00 am-12:00 pm Central
Nashville	William R. Snodgrass Tennessee Tower (Tennessee Room 1 – 3rd floor) 312 Rosa L Parks Blvd, Nashville, TN 37219	April 27, 2016 1:00-4:00 pm Central
Cookeville	Upper Cumberland Regional Health Office 100 England Dr, Cookeville, TN 38501	April 28, 2016 9:00 am-12:00 pm Central
Gray	ETSU Natural History Museum (Gray Fossil Site) 1212 Suncrest Drive, Gray, TN 37615	April 29, 2016 9:00 am-12:00 pm Eastern
Fayetteville	Fayetteville City Municipal Building (Auditorium) 110 Elk Avenue S, Fayetteville, TN 37334	May 3, 2016 5:00-8:00 pm Central
Jackson	Jackson Madison County Library (Program Center) 433 E Lafayette St, Jackson, TN 38301	May 4, 2016 1:00-4:00 pm Central
Memphis	University of Memphis - University Center (Fountain View Room [UC 350]) 499 University Street, Memphis, TN 38111	May 5, 2016 4:00-7:00 pm Central

Public Forum Agenda

Introduction	5 min
2015 State Health Plan Update • Goals for Today • Evolution of the State Health Plan • State Health Plan Criteria • Progress & Evaluation	20 min
Group Discussion: Activity 1 • In small groups, discuss and present thoughts on State Health Plan criteria and progress measures.	30 min
State Population Health Improvement Plan • Development Process ○ CMS State Innovation Model • Opportunities & Recommendations	20 min
Group Discussion: Activity 2 • In small groups, discuss and present thoughts on priority health topics and regional applicability of recommendations.	30 min
Open Comments • Additional feedback, comments, or questions.	20 min
Wrap Up	5 min

Group Discussion Activity 1

Remember to:

- **Nominate a scribe to document your responses.**
- **Nominate a speaker to present your responses.**

As a group, seek to answer the following questions:

Proposed State Health Plan Criteria

- Are these the three most important factors to consider for a new policy, program or intervention?
- How would you adapt these proposed criteria?

Excerpt of Proposed Criteria

1. *Policies, programs, and interventions should focus on **prevention**.*
    - *New policies, programs, and interventions should focus on moving upstream.*
2. *Policies, programs, and interventions should be **evidence-based**, or should contribute to the scientific literature.*
    - *We want to be **responsible stewards** and ensure that the investments we make in the health of the people in Tennessee **affect significant change**.*
    - *Evaluation is necessary to know if ongoing programs are effective.*
    - *New policies, programs, and interventions should be rooted in evidence and should be proven successful in pilot populations.*
    - *We do also **encourage innovation**. If a new policy, program, or intervention is unique, innovative, or a pilot, an evaluation plan should be built-in so that the experiment can be analyzed and can contribute to the existing scientific literature.*
3. *Policies, programs, and interventions should **improve the overall health** of people in Tennessee.*
    - *New policies, programs, and interventions should improve health outcomes, diminish health disparities or address social determinants of health.*

Group Discussion Activity 1

NAM (NAM) Vital Signs

- Which of these core and priority measures make sense for Tennessee?
- How would you adapt these metrics to make them more relevant?

NAM Core Measure	NAM Related Priority Measures
Life Expectancy	Infant mortality Maternal mortality Violence and injury mortality
Well-Being	Multiple chronic conditions Depression
Overweight & Obesity	Activity levels Healthy eating patterns
Addictive Behavior	Tobacco use Drug dependence/illicit use Alcohol dependence/misuse
Unintended Pregnancy	Contraceptive use
Healthy Communities	Childhood poverty rate Childhood asthma Air quality index Drinking water quality index
Preventive Services	Influenza immunization Colorectal cancer screening Breast cancer screening
Care Access	Usual source of care Delay of needed care
Patient Safety	Wrong-site surgery Pressure ulcers Medication reconciliation
Evidence-Based Care	Cardiovascular risk reduction Hypertension control Diabetes control composite Heart attach therapy protocol Stroke therapy protocol Unnecessary care composite
Care Match with Patient Goals	Patient experience Shared decision making End-of-life/advanced care planning
Personal Spending Burden	Health care-related bankruptcies
Population Spending Burden	Total cost of care Health care spending growth
Individual Engagement	Involvement in health initiatives
Community Engagement	Availability of healthy food Walkability Community health benefit agenda

Group Discussion Activity 2

Remember to:

- **Nominate a scribe to document your responses.**
- **Nominate a speaker to present your responses.**

As a group, seek to answer the following questions:

Regional Relevance of Health Topics

- Discuss each of the five health topic areas and rank them in terms of relevance to your region. 1 is the most relevant and 5 is the least relevant.

  _____ Perinatal Health

  _____ Child Health

  _____ Tobacco Use

  _____ Diabetes

  _____ Obesity

- Please outline why each topic received its relative ranking.

Group Discussion Activity 2

Regional Recommendations

- Review the key regional recommendations below provided by our academic public health partners and answer the following questions:
  - Will these recommendations be effective in your region?
  - If you don't believe they would be successful, how would you adapt them?
  - What suggestions do you have for successfully implementing these recommendations?
  - What examples can you share of best practices in your region addressing these health topics?

Health Topic	Recommendations
Perinatal Health	Establish a regional **NAS Task Force**, to include representatives of public health stakeholders, additional involvement from law enforcement, the judicial system, and elected officials. This group would be responsible for developing action plans, and overseeing the implementation and evaluation of those plans. Create a role for a full-time **NAS Task Force Coordinator** to be housed at the regional health office, whose roles and responsibilities would include facilitating the work of the NAS Task Force, providing annual reports on NAS in their region, and serving as the primary liaison with the TDH Central Office regarding NAS in their region. Review provisions for **preconception pregnancy testing and contraception use** in the setting of opioid prescription use during pregnancy.
Child Health	Implement **Community-Centered Health Neighborhoods**. Community-Centered Health Neighborhoods include effective integration of community-based prevention into health services delivery. This expands coverage and access while addressing non-medical needs that impact health. It improves quality by closing the loop in patient-centered care. This reduces cost by improving patient follow-through on referrals and treatment plans and decreasing additional interventions. Implement **Community Grand Rounds**. Community Grand Rounds would be a play on the medical school grand rounds, the teaching and learning tool consisting of presenting medical problems and treatment of a particular patient to an audience of doctors, residents and students. This would help bridge the gap between the medical/health care sector and the community, and facilitate understanding on both sides. They would offer a venue for all to dialogue about expected outcomes and what the role of the communities could be. They would promote awareness and translation of ideas across different groups.- Provide, or increase access to, earlier and more effective **behavioral and mental health screenings** and services in an effort to encourage better health outcomes through earlier interventions.
Tobacco Use	Expand the use of longitudinal school-based tobacco education programs, such as the **Michigan Model**, which is currently in use in 41.4% of Tennessee schools. Extend **access to cessation aids** and services, especially for youths. Consider removing the **state preemption** of tobacco policy to allow local autonomy for communities who wish to enforce more strict tobacco policies than the current state policy.
Diabetes	Work with community groups, employers, and local health departments to develop more **community gardens**. Ensure dieticians and diabetes educators provide culturally sensitive information that helps **patients address interpersonal factors** that may affect decision making (like how to prepare diabetic foods for family/social event). Train physicians to focus on **prediabetes** and diabetes prevention.
Obesity	Expand existing and successful local programs that offer low-income neighborhoods access to healthy food choices, like the **"Green Machine"** mobile food unit in Memphis. Create partnerships between different community organizations to use existing facilities (like schools and churches) as **after-hours community centers** for exercise in rural communities that lack these resources. Use the **built environment** as much as possible. When building new buildings, make sure stairs are centrally located and easy to find. Make sure water fountains are available and advertised. In communities that struggle to use existing parks due to safety concerns, partner with police to ensure safety of walking groups and run clubs.

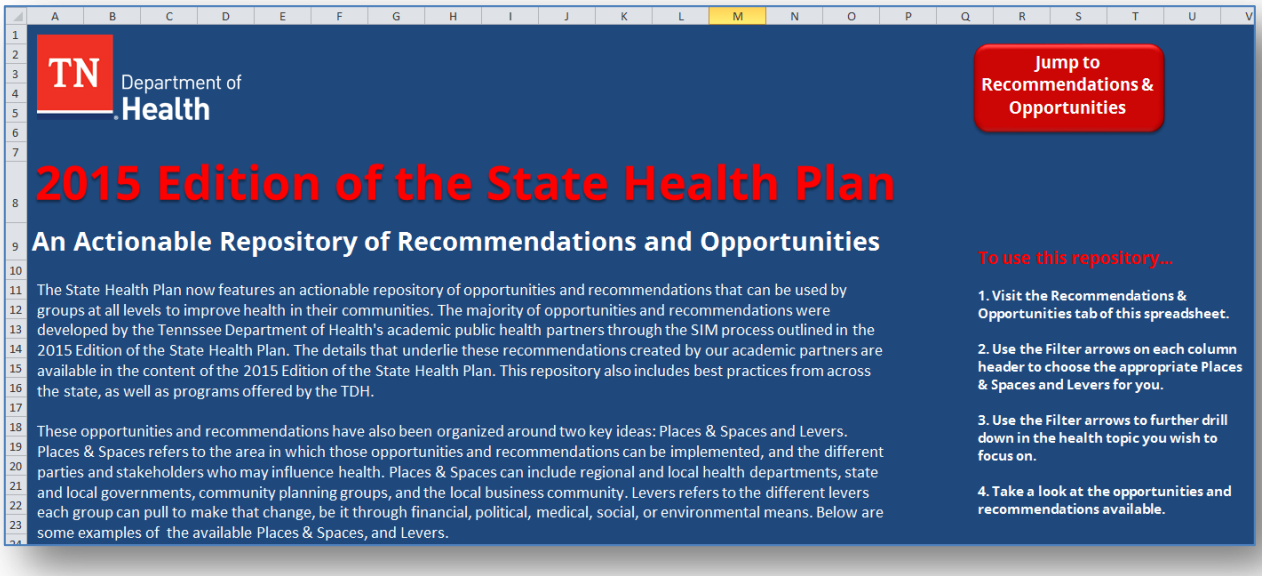
Appendix D: Actionable Repository of Opportunities and Recommendations

The actionable repository of opportunities and recommendations is housed on the State Health Plan's website. Download a version here: http://tn.gov/health/article/state-health-plan

To use this repository:

1. Read the Introduction tab.
2. Visit the Recommendations & Opportunities tab.
3. Use the Filter arrows on each column header to choose the appropriate Places & Spaces and Levers for you.
4. Use the Filter arrows to further drill down in the health topic you wish to focus on.
5. Take a look at the opportunities and recommendations available.

Below are screenshots of the 2015 Edition of the Actionable Repository.



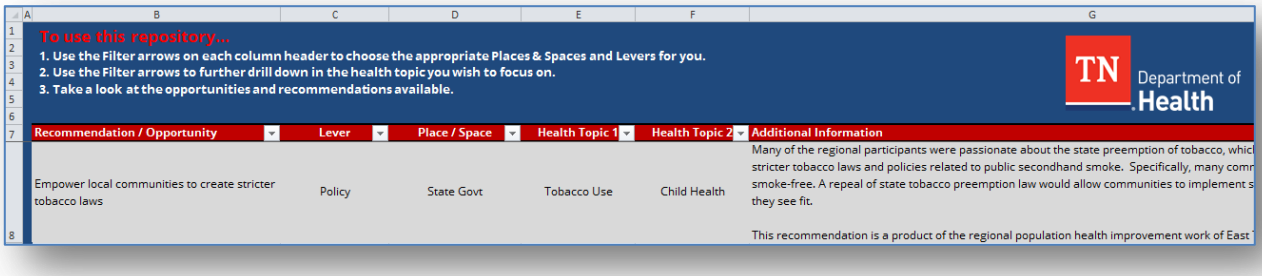


Exhibit 1: List of Participants from School Stakeholder Meetings

Participants in the schools' regional stakeholder meetings included representatives from for-profit and not-for-profit hospitals, county and regional health departments and health councils, insurance carriers and payers, dental clinics, ambulance services, charity care clinics, Federally Qualified Health Centers, pediatric provider groups, drug coalitions, city councils, city and county school boards, local anti-drug coalitions, community outreach groups, children's and rehabilitation specialty hospitals, pharmacy schools, rural health centers, behavioral and mental health centers, agricultural services, business coalitions, planning organizations, and various non-profit committees.

Also in attendance were individual stakeholders such as early childhood school principals, day care directors, child abuse prevention advocates, local parents, faith leaders, circuit court judges, pharmacists, pediatricians, behavioral and mental health advocates, rural health providers, health care researchers, teachers, local banks and other employers, and university students and faculty members.