

Health and Well-being Measurement Approach and Assessment Guide



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Authors

Team Leaders

- Carley L. Riley, MD, MPP, MHS, FAAP, Assistant Professor, University of Cincinnati Department of Pediatrics; Attending Physician, Cincinnati Children's Hospital
- Brita Roy, MD, MPH, MHS, Assistant Professor, Yale Schools of Medicine and Public Health; Director of Population Health, Yale Medicine
- Matthew C. Stiefel, MPA, MS, Senior Director, Center for Population Health, Kaiser Permanente
- Marianne McPherson, PhD, Senior Director, Institute for Healthcare Improvement
- Julia Nagy, MPH candidate, Project Manager, Institute for Healthcare Improvement

Contributors

- Tasha Straszewski, PhD, MA: Data Analyst Graduate Intern, Center for Population Health, Kaiser Permanente
- Allie Lonstein, MD candidate: Frank H. Netter MD School of Medicine

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Foreword

August 17, 2020

In 2016, we wrote *100 Million Healthier Lives Measurement System: Progress to Date*,¹ which described 100 Million Healthier Lives' approach to measuring health and well-being at that time. More than five years later, in the midst of the COVID-19 pandemic and massive social upheaval, including socioeconomic distress and anti-racism demonstrations, the importance of equitable health and well-being has never been more apparent. Following the initial wave of COVID-19 cases, we expect to see a second wave of poor well-being, mental health, and despair as a result of the pandemic and its associated impacts on social behaviors, the economy, and community vitality. According to Gallup, the percentage of Americans who self-reported that they were “thriving” in April 2020 had reached its lowest point in more than a decade, decreasing by nearly nine points since the beginning of the year, from 55.3 percent to 46.4 percent.² This number is equivalent to the percentage of Americans who said they were “thriving” at the lowest point of the Great Recession in 2008. In April 2020, the majority of Americans, the remaining 53.6 percent, were “struggling” or “suffering.” Tracking health and well-being is vital, now more than ever.

The field, and our thinking on the subject, have evolved quickly since we published the initial report in 2016. We have now developed a deeper understanding of the complexities and components of health and well-being. Well-being, in addition to health, has also come into much wider use, as exemplified by its inclusion in the Healthy People 2030 framework, as a result of 100 Million Healthier Lives' work on the topic. This guide is intended to serve as a resource for understanding the current state of the field of health and well-being as it relates to measurement. The guide also provides guidance for administering the *Well-being Assessment (Adult – 12 items)* and *Well-being Assessment (Youth)* developed by the 100 Million Healthier Lives Metrics Team, convened by the Institute for Healthcare Improvement.

We hope this information facilitates your journey to improve health, well-being, and equity in your community.

Best,

The 100 Million Healthier Lives Metrics Team

¹ Stiefel MC, Riley CL, Roy B, Ramaswamy R, Stout S. *100 Million Healthier Lives Measurement System: Progress to Date*. 100 Million Healthier Lives Metrics Development Team Report. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2016.

² Worry and Stress Fuel Record Drop in U.S. Life Satisfaction. Gallup. <https://news.gallup.com/poll/310250/worry-stress-fuel-record-drop-life-satisfaction.aspx>.

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About 100 Million Healthier Lives

The 100 Million Healthier Lives Initiative

100 Million Healthier Lives (100MLives) was an unprecedented six-year collaboration of change agents across sectors pursuing an unprecedented result.

- Mission: 100 million people living healthier lives by 2020.
- Vision: to fundamentally transform the way the world thinks and acts to improve health, well-being, and equity to get to breakthrough results.

Together, the movement worked to create solutions to the most intractable challenges that stand in the way of achieving health, well-being, and equity across the globe. Members worked together to change the world in meaningful ways — among children, adolescents, adults, veterans, and older adults — on topics including nutrition, mental health, education, homelessness, and more.

100MLives was a multi-sector, public-private partnership of more than 1,500 patients, community members, leaders, organizations, agencies, and implementers across a wide range of domains including public health, community health, health care, education, policy, academia, business, government, and finance.

Defining Health and Well-Being in 100 Million Healthier Lives

100MLives recognizes that health and well-being are interconnected concepts that people define for themselves, and 100MLives embraces person-reported measures of health and well-being. This guide describes how to apply one tool for assessing these person-reported measures. As an initiative, 100MLives has adopted the Healthy People 2030 definition of health and well-being: “how people think, feel, and function — at a personal and social level — and how they evaluate their lives as a whole.”³

- **Think** reflects the ability to understand, evaluate, and solve problems in daily life; experience optimism; express gratitude; acknowledge self-worth; and believe that life and social circumstances are to some degree under personal control, even while seeking personal growth, autonomy, and competence.
- **Feel** reflects a sense of security and a feeling of satisfaction with life. It involves vigor and vitality, feeling healthy and full of energy, and being able to flourish psychologically, balance negative and positive emotions, and maintain fulfilling social connections.
- **Function** reflects physiological conditions within the body along with the ability to meet personal and collective (e.g., family, neighborhood, community) needs under changing conditions in society. It entails being accepted into and belonging to a community, providing and receiving support from others, and acting as a legitimate contributor to a common world.

The 100MLives definition of health and well-being includes two components of health (physical health and mental health) and three components of well-being (evaluative well-being, emotional well-being, and meaning and purpose). This interconnectedness is illustrated in the graphic below. You can find a more detailed description and definition of health and well-being in **Appendix A: Defining Health and Well-being**. A more complete explanation of the importance of measuring well-being specifically and how improvement efforts may impact well-being can be found in

³ Pronk N, Kottke T, Milstein B, et al. “Health and Well-Being.” In *Issue Briefs to Inform Development and Implementation of Healthy People 2030*. Secretary’s Advisory Committee for Healthy People 2030. https://www.healthypeople.gov/sites/default/files/HP2030_Committee-Combined-Issue%20Briefs_2019-508c.pdf.

Appendix B: Why Measure Well-being? and

Appendix C: 100 Million Healthier Lives Theory of Change.

Additionally, it is not possible to achieve health and well-being for a population without closing the equity gaps that generate, in some places, 25-year differences in life expectancy between people living as little as two miles apart.⁴ Finally, a governing principle behind 100MLives was that communities can influence the health and well-being of their members individually and collectively in many different ways. Because the pathways between community action and changes in health and well-being are complex, it is not immediately possible to measure the impact of local improvements on more distal outcomes. However, measuring the achievements of community health initiatives and perceptions of health and well-being in a systematic way helps build the infrastructure to measure this impact.

100 Million Healthier Lives Metrics Team

The 100MLives Metrics Team was convened to identify and address the measurement needs of the movement. The team's goals included establishing a definition and a measure of healthier lives in addition to implementing the measure in communities. The core members of this team over the last six years of 100MLives were:

- Carley L. Riley, MD, MPP, MHS, FAAP, Assistant Professor, University of Cincinnati Department of Pediatrics; Attending Physician, Cincinnati Children's Hospital
- Brita Roy, MD, MPH, MHS, Assistant Professor, Yale Schools of Medicine and Public Health; Director of Population Health, Yale Medicine
- Somava Saha, MD, MS, Executive Lead, Well-being & Equity (WE) in the World
- Matthew C. Stiefel, MPA, MS, Senior Director, Center for Population Health, Kaiser Permanente

⁴ Life Expectancy Map: New Orleans - Infographic. Robert Wood Johnson Foundation. <https://www.rwjf.org/en/library/infographics/new-orleans-map.html>.

- Marianne McPherson, PhD, Senior Director, Institute for Healthcare Improvement
- Julia Nagy, MPH candidate, Project Manager, Institute for Healthcare Improvement
- Laura Howell, Project Manager, Institute for Healthcare Improvement
- Tasha Straszewski, PhD, MA, Data Analyst Graduate Intern, Center for Population Health, Kaiser Permanente
- Allie Lonstein, MD candidate, Frank H. Netter MD School of Medicine

Well-being Assessment (Adult – 12 items) – 100 Million Healthier Lives

About the Assessment

This assessment gives individuals and groups who are working to improve the health of their communities a short, holistic tool to measure and track health and well-being outcomes and improvements. It comprises items from validated instruments, was created in collaboration with experts in the field, and was tested in member organizations and communities. The assessment can also be administered with a set of sociodemographic items to enable stratification of health and well-being results in order to assess equity and ultimately close gaps. These sociodemographic items can be found in

Appendix D: Well-being Assessment (Adult – 12 items) – 100 Million Healthier Lives Sociodemographic Items.

The Well-being Assessment (Adult - 12 items) consists of 12 items assessing health and well-being. It contains three health items, which measure:

- Physical health (item 4)
- Mental health (item 5)
- Physical function (item 6)

It also includes nine well-being items, which measure:

- Life evaluation (items 1 and 2; current life evaluation and future life evaluation)
- Financial evaluation (item 3)
- Purpose (item 7)
- Relationships (item 8; loneliness)
- Community and social support (items 9 and 10; sense of belonging to one's community and social support)
- Affect (items 11 and 12; positive and negative emotions)

- Most of the items were psychometrically validated as single-item measures. Sources for each of these items can be found in

Appendix E: Well-Being Assessment (Adult – 12 items) – 100 Million Healthier Lives Item Sources.

This version of the assessment is an update to the original version published in 2016. An explanation of the changes and rationale behind them can be found in

Appendix F: Versions of the Well-being Assessment (Adult – 12 items) 100 Million Healthier Lives.

Why Should You Use This Assessment?

This assessment is one instrument in a wide landscape of tools used to measure health and well-being. There is variation within the landscape, and all tools have relative advantages and disadvantages. Early in the 100MLives movement, the Metrics Team identified a gap in the field and the need for a concise, freely available tool for communities to measure the many aspects of health and well-being. The tool also had to be effectively administered in the field by both volunteers and trained individuals. This gap is addressed by the short, yet comprehensive, *Well-being Assessment (Adult – 12 items)*. The value of this assessment is that, with 12 questions, users can measure evaluative well-being as well as more specific health and well-being domains including purpose; affect; physical health, mental health, and physical function; relationships; community and social support; and financial evaluation.

Well-being Assessment (Adult - 12 items) - 100 Million Healthier Lives

Please **circle the answer** that best represents your response to the questions below.

For the **first three questions** please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the **best possible life for you** and the bottom of the ladder represents the **worst possible life for you**.

1. On which step of the ladder would you say you personally feel you stand at this time?

Worst possible 0 1 2 3 4 5 6 7 8 9 10 Best possible

2. On which step do you think you will stand about five years from now?

Worst possible 0 1 2 3 4 5 6 7 8 9 10 Best possible

3. Now imagine the top of the ladder represents the best possible financial situation for you, and the bottom of the ladder represents the worst possible financial situation for you. Please indicate where on the ladder you stand right now.

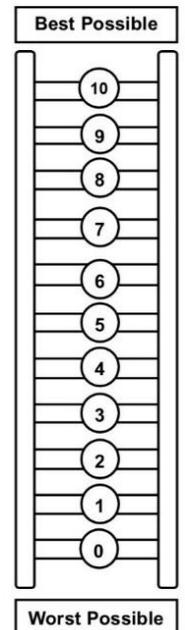
Worst possible 0 1 2 3 4 5 6 7 8 9 10 Best possible

4. In general, how would you rate your physical health?

Poor 0 1 2 3 4 5 6 7 8 9 10 Excellent

5. How would you rate your overall mental health?

Poor 0 1 2 3 4 5 6 7 8 9 10 Excellent



6. For at least the past 6 months, to what extent have you been limited because of a health problem in activities people usually do?

Not limited at all											Severely limited
0	1	2	3	4	5	6	7	8	9	10	

7. I have a sense of direction and purpose in life.

Strongly disagree											Strongly agree
0	1	2	3	4	5	6	7	8	9	10	

8. How often do you feel lonely?

Never											Always
0	1	2	3	4	5	6	7	8	9	10	

9. How would you describe your sense of belonging to your local community?

Very weak											Very strong
0	1	2	3	4	5	6	7	8	9	10	

10. If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?

Never											Always
0	1	2	3	4	5	6	7	8	9	10	

11. During the past two weeks, how often have you experienced positive emotions such as joy, affection, or hope?

Never											All of the time
0	1	2	3	4	5	6	7	8	9	10	

12. During the past two weeks, how often have you experienced negative emotions such as sadness, worry, or despair?

Never											All of the time
0	1	2	3	4	5	6	7	8	9	10	

Attribution information for this assessment can be found in

Appendix G: Attribution and Citation for the Well-being Assessments.

Well-being Assessment (Youth) – 100 Million Healthier Lives

About the Assessment

The Well-being Assessment (Youth) was designed to be completed by individuals between the ages of 12 and 18 years, as many items were developed and validated for this age range. If, however, individuals or groups want to utilize this assessment in samples that include individuals slightly younger or older than this age range, they may do so. In these cases, however, it may be important to assess understandability and relevance to those younger and older than the intended age range.

The assessment gives individuals and groups working to improve the health and well-being of their communities a short, holistic tool to measure and track health and well-being outcomes and improvements. The brief assessment, composed of items from validated instruments, was created in collaboration with experts in the field and tested in member organizations and communities. The assessment can also be administered with a set of sociodemographic items to enable stratification of health and well-being results to assess equity and close gaps.

The first two items of the Well-being Assessment (Youth) provide a general assessment of well-being. The overall categorization of “Thriving,” “Struggling,” or “Suffering” is based on overall life evaluation, assessed by the first two items. Items 3 through 11 provide information about the different domains of youth health and well-being. The following are the domains and their respective items:

- Life evaluation (items 1 and 2)
- Cognitive well-being (items 3 and 6)
- Meaning & purpose (items 4 and 7)
- Social well-being (items 5 and 9)
- Emotional well-being (items 8 and 10)
- Physical well-being (item 11)

The remaining items of the assessment provide sociodemographic information, which allows for stratification of results of the first 11 questions and an assessment of equity and equity gaps.

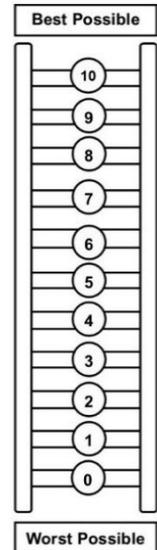
Source information for these questions can be found in

Appendix H: Well-Being Assessment (Youth) – 100 Million Healthier Lives Item Sources.

Well-being Assessment (Youth) - 100 Million Healthier Lives

Please **circle the answer** that best represents your response to the questions below.

For the first 11 questions, select the answer that best applies to you. There are no right or wrong answers.



1. On which step of the ladder would you say you personally feel you stand at this time?

Worst possible 0 1 2 3 4 5 6 7 8 9 Best possible 10

2. On which step do you think you will stand about five years from now?

Worst possible 0 1 2 3 4 5 6 7 8 9 Best possible 10

3. If something interests me, I try to learn more about it.

Strongly Agree Somewhat Agree Neither Agree Nor Disagree Somewhat Disagree Strongly Disagree

4. My life will make a difference in the world.

Strongly Agree Somewhat Agree Neither Agree Nor Disagree Somewhat Disagree Strongly Disagree

5. I feel I am an important part of my community.

Strongly Agree Somewhat Agree Neither Agree Nor Disagree Somewhat Disagree Strongly Disagree

6. I like coming up with new ways to solve problems.

Exactly Like Me A Lot Like Me Somewhat Like Me A Little Like Me Not At All Like Me

7. If I set goals, I take action to reach them.

Exactly Like Me A Lot Like Me Somewhat Like Me A Little Like Me Not At All Like Me

8. Setbacks don't discourage me.

Exactly Like Me A Lot Like Me Somewhat Like Me A Little Like Me Not At All Like Me

9. I have:

A friend who I can count on to be there for me.	Yes	No
A family member who I can count on to be there for me .	Yes	No
An adult in my life who cares about my future.	Yes	No
At least one teacher who makes me excited about the future.	Yes	No

10. In general, how would you rate your emotional health?

Excellent Very Good Good Fair Poor

11. In general, how would you rate your physical health?

Excellent Very Good Good Fair Poor

For the **final 7 questions**, please provide demographic information about yourself.

12. What is your age? _____ years

13. What is your gender? Male Female Transgender Other

14. Which one or more of the following would you say is your race/ethnicity? (select all that apply)

White Black or African American American Indian or Alaska Native Asian Pacific Islander Middle Eastern or North African Hispanic or Latino/a Other

15. Are you currently in school?

- Yes
- No

16. If you are currently in school, in what grade are you now?

- 6th Grade
- 7th Grade
- 8th Grade
- 9th Grade
- 10th Grade
- 11th Grade
- 12th Grade
- Ungraded or other grade
- Enrolled in GED classes
- College classes

17. If you are not currently in school, what is the highest level of education you have completed?

- No schooling completed
- Nursery school
- Kindergarten

- 1st Grade
- 2nd Grade
- 3rd Grade
- 4th Grade
- 5th Grade
- 6th Grade
- 7th Grade
- 8th Grade
- 9th Grade
- 10th Grade
- 11th Grade
- 12th Grade
- GED or Alternative Credential
- Some College
- Associate's Degree (e.g., AA, AS)
- Bachelor's Degree (e.g., BA, BS)
- Master's Degree (e.g., MA, MS, MEng, MEd, MSW, MBA)
- Professional Degree beyond a Bachelor's Degree (e.g., MD, DDS, DVM, LLB, JD)
- Doctorate Degree (e.g., PhD, EdD)

18. What is the ZIP code where you live? _____

Attribution information for this assessment can be found in

Appendix G: Attribution and Citation for the Well-being Assessments.

Administering the Well-being Assessments

How to Administer the Assessments

Depending on what is most feasible in your setting, you may administer the assessment verbally (i.e., ask the questions of the person) or in paper-and-pencil or electronic forms. In any of these formats, it is critical to consider factors including sociocultural context, trust, feasibility, and costs, both for administering and analyzing the assessments. The following is suggested introductory language for both options.

For verbal administration:

Hello, I am part of [organization name]. We are working to [organization goal] (e.g. improve the health and well-being of our community; understand equity gaps in our community). Our first step is to find out how our community members are doing right now. Would you be willing to spend 3 minutes [modify if more questions added] answering [number] questions to help us understand how you're doing?

For written administration:

Hello, I am part of [organization name]. We are working to [organization goal] (e.g. improve the health and well-being of our community; understand equity gaps in our community). Our first step is to find out how our community members are doing right now. Would you be willing to spend 3 minutes [modify if more questions added] completing the [attached/linked] [number] question survey to help us understand how you're doing?

Timing of Baseline and Follow-up Assessments

The *baseline assessment* is used as a starting point for your measurement. It is important to collect baseline data right before the start of your intervention or as close to the start as possible. Ideally, all data for baseline assessments should be collected within one month.

Follow-up assessments should use the same questionnaire (or gather the same information) as your baseline assessment. These follow-up assessments should be performed at regular intervals during the course of the program. We recommend performing the assessment quarterly, although this is not a strict guideline; the intervals can be longer or shorter. It may be beneficial, for example, to administer a subset of questions most closely related to an active improvement effort more frequently. It also may be appropriate, in a health care setting, for example, to administer the survey at every patient encounter as a well-being "vital sign." We recommend an interval of no longer than one year between administrations.

Using the Measurement of Well-being

Scoring the Well-being Assessments

Life evaluation, measured using responses to the two Cantril's Ladder items, is the most straightforward score to calculate, and may be used as a proxy for well-being. Individuals are categorized based on their responses as shown in the table below. To be categorized as Thriving, individuals must evaluate both their current *and* future life at a high level. To be categorized as Suffering, individuals must evaluate both their current *and* future life at a low level. At all other combinations of current and future life evaluation, individuals are considered Struggling.

Life Evaluation (Cantril's Ladder)	Current Life Evaluation (Item 1)	Future Life Evaluation (Item 2)
Thriving	7-10	<i>and</i> 8-10
Struggling	All other Item 1 and Item 2 score combinations	
Suffering	0-4	<i>and</i> 0-4

All other items in the *Well-being Assessment (Adult – 12 items)* should be evaluated individually, separately from the Cantril's Ladder items, to identify areas of strength or opportunity. Items 11 and 12 may be evaluated together as an additional composite measure, *Affect Balance*, which provides a ratio of positive emotion to negative emotion in one's life. A detailed explanation of scoring methodologies can be found in

Appendix I: Scoring the Well-being Assessment (Adult – 12 items) – 100 Million Healthier Lives.

We encourage you to use the assessment to assess equity gaps in your community or organization. You can stratify results for well-being and for each item by race, ethnicity, and other sociodemographic characteristics to identify equity gaps in who is Thriving, Struggling, and Suffering.

How is measuring for improvement different than measuring for change in outcomes?

These Well-being Assessments can be used for measuring either improvement or outcomes. Measuring for improvement (either process or quality improvement) is usually done using sequential, frequent, observable tests using small samples. The goal is to gather “just enough” data to understand if a program change has led to the intended result.

In contrast, measuring outcomes is performed less frequently and among a much larger number of participants. The goal is to determine the impact a program has on the entire *target population*. It is important to get information from all participants (*whole cohort*) or from a *random sample* of participants that can approximate results from all participants. Detailed information around sampling, including identifying a target population, randomization, determining sample size, and more, can be found in

Appendix J: Sampling.

Applications for Communities and Community Organizations

There are many ways communities and community-based organizations can utilize assessments to understand the individuals and populations they comprise and serve. These include identifying the needs and assets of individuals, identifying population-level inequities, assessing community health assets and needs, and evaluating policies or interventions over time at individual or population levels. Each of these potential uses is detailed below:

- **Identifying the needs and assets of individuals.** Life evaluation scores, as well as scores on individual items, can aid in identifying and addressing the needs of individuals completing the assessment. For example, if an individual indicates poor financial well-being, they can be connected with appropriate supports in the community, such as utilities or food assistance. Similarly, if an individual indicates that they have strong social support, that asset can be leveraged to support improvement of other aspects of health and well-being.
- **Community health needs assessment.** Assessing the health and well-being of a population can provide a holistic understanding of how a community is doing. Such an assessment describes how people feel and function while living in their community. Factors affecting community dwellers' well-being span multiple sectors, including social and economic factors, health care factors, and environmental factors. If a health and well-being domain is low, multi-sector collaborations can be developed to design comprehensive interventions to address these areas of need.
- **Identifying community assets.** If a particular sociodemographic group or ZIP code has a higher level of health and well-being than the community average, the community may wish to leverage that strength or explore the roots of the positive deviation. Identifying groups who may be able to help support others or identifying well-being–related resources that a particular group has access to may help a community understand and plan how to optimize health and well-being for all.
- **Identifying population-level inequities.** If optional sociodemographic data is collected at the time of health and well-being assessment administration, aggregated population scores can be used to assess whether equity gaps in health and well-being are present, either by specific sociodemographic characteristics or by location of residence. If a particular sociodemographic subgroup has lower health and well-being than others, a community or community organization may further investigate the causes, and interventions to address them can be designed and tested. And if a particular school, neighborhood, or ZIP code has lower health and well-being, then perhaps a community-level intervention may be designed and tested to improve outcomes in this locality.
- **Evaluation over time.** Tracking health and well-being over time at the individual and/or population level can provide useful information regarding how well a policy, program, or other intervention is working. It also can be used to monitor for risk of poor outcomes. For example, if a decline in health and well-being is seen, it may be a signal that a person/population is experiencing food or housing insecurity. It could be used as a mechanism to understand what may be occurring and connect that person/family/community to additional individual- or population-level supports.

Applications for Health Care Organizations

There are several ways that physicians and health systems could use assessments of well-being at individual and population levels. These include personalized coaching with an individual patient using their well-being scores, risk stratification at the individual or population levels, identifying populations with

equity gaps in well-being outcomes, evaluating treatments or programs over time at individual or population level, and assessing community health needs. Each of these potential uses is detailed below:

- **Coaching with an individual patient.** Health and well-being scores may be used in motivational interviewing or with other health coaching techniques to understand what is most important to the patient. For example, a clinician could ask a patient why they put themselves on the current ladder where they did, where they would like to see themselves on the ladder in months or years, what might help them reach that desired place on the ladder, and what might get in the way. The clinician can then gain an understanding of what matters to and motivates the patient, what strengths can be drawn upon, and what challenges need to be addressed for that patient.
- **Risk stratification.** It is possible, though not yet proven, that health and well-being scores could also be used for risk stratification at the individual and/or population levels. At the individual level, a low score in life evaluation or any of the more specific health and well-being domains may indicate that more attention is necessary to that particular domain. A provider might use some of the coaching techniques described above to assess why the patient scored themselves low in a particular domain or in their life evaluation. Based on their responses, a provider may decide to follow-up with social needs assessments or mental health screener questionnaires. At the population level, it is possible that health and well-being scores could be included in algorithms to predict risk of death or acute care utilization.
- **Identifying population-level inequities.** Aggregated population health and well-being scores can also be used to assess whether equity gaps are present, either by specific sociodemographic characteristics or by location of residence. If a particular sociodemographic subgroup has lower health and well-being, further evaluation of the causes and interventions to address them can be designed and tested. Analogously, if a particular neighborhood or ZIP code has lower health and well-being, a community-level intervention may be designed and tested to improve scores.
- **Evaluation over time.** Tracking health and well-being over time at the individual and/or population level can provide useful information regarding how well a treatment or program is working. It can also be used to monitor for risk of poor outcomes. For example, if an improvement or decline in health and well-being is seen, it may be a signal that a treatment plan is or is not working as intended, or that another external factor is influencing that patient's quality of life.
- **Community health needs assessment and/or population surveillance.** Assessing the health and well-being of a population can provide a more holistic understanding of how a community is doing. Such an assessment describes how people feel and function living in their community. Factors affecting community dwellers' well-being span multiple sectors, including social and economic factors, health care factors, and environmental factors. If life evaluation or a specific domain of health and well-being is low, multi-sector collaborations can be developed to design comprehensive interventions to address these areas of need in the community. Furthermore, because health and well-being is positively framed, it can also be used to identify community strengths and assets that could potentially be leveraged to address areas of need.

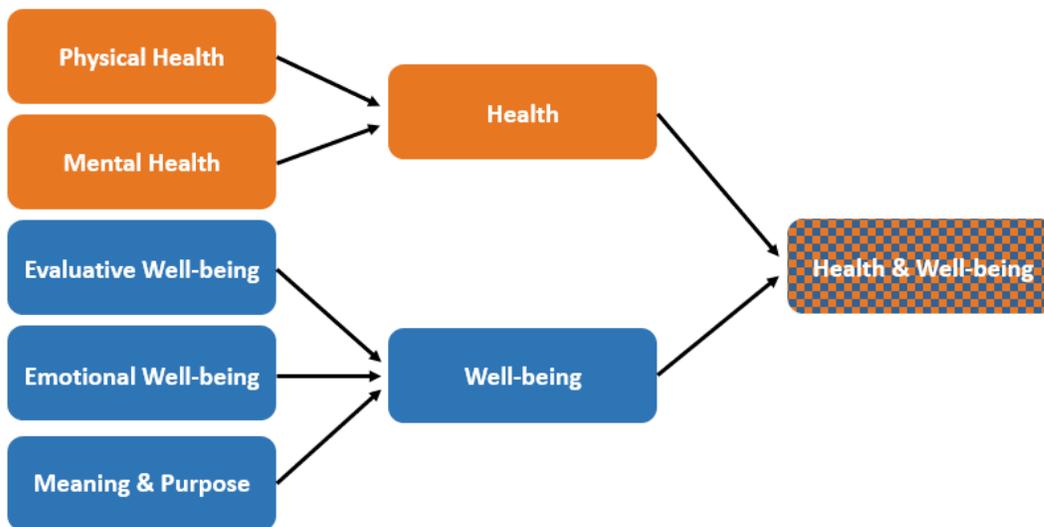
Appendices

Appendix A: Defining Health and Well-being

100MLives recognizes that health and well-being are interconnected concepts that people define for themselves, and 100MLives embraces person-reported measures of health and well-being. This guide describes how to apply one tool for assessing these person-reported measures. As an initiative, 100MLives has adopted the Healthy People 2030 definition of health and well-being: “How people think, feel, and function—at a personal and social level—and how they evaluate their lives as a whole.”

- **Think** reflects the ability to understand, evaluate, and solve problems in daily life; experience optimism; express gratitude; acknowledge self-worth; and believe that life and social circumstances are to some degree under personal control, even while seeking personal growth, autonomy, and competence.
- **Feel** reflects a sense of security and a feeling of satisfaction with life. It involves vigor and vitality, feeling healthy and full of energy, and being able to flourish psychologically, balance negative and positive emotions, and maintain fulfilling social connections.
- **Function** reflects physiological conditions within the body along with the ability to meet personal and collective (e.g., family, neighborhood, community) needs under changing conditions in society. It entails being accepted into and belonging to a community, providing and receiving support from others, and acting as a legitimate contributor to a common world.⁵

The 100MLives definition of health and well-being includes two components of health (physical health and mental health) and three components of well-being (evaluative well-being, emotional well-being, and meaning and purpose). In the literature, emotional well-being is also called hedonic well-being, and meaning and purpose is called eudaimonic well-being.⁶



⁵ Pronk N, Kottke T, Milstein B, et al. “Health and Well-Being.” In *Issue Briefs to Inform Development and Implementation of Healthy People 2030*. Secretary’s Advisory Committee for Healthy People 2030.

https://www.healthypeople.gov/sites/default/files/HP2030_Committee-Combined-Issue%20Briefs_2019-508c.pdf.

⁶ Subjective well-being: measuring happiness, suffering, and other dimensions of experience. In A.A. Stone & C. Mackie (eds.). *Panel on Measuring Subjective Well-Being in a Policy-Relevant Framework*. The National Academies Press; 2013.

Equity and sustainability are essential elements of building health and well-being in a community. It is not possible to achieve health and well-being for the population without closing the equity gaps that generate, in some places, 25-year differences in life expectancy between people living as little as two miles apart.⁷ Health and well-being can only be meaningfully achieved if they are distributed equitably and sustained over time.

Communities can influence the health and well-being of their members individually and collectively in many different ways. Because the pathways between community action and changes in health and well-being are complex, it is not immediately possible to link local improvements and change in more distal outcomes. However, by measuring the achievements of community health initiatives and perceptions of well-being in a systematic way, the infrastructure for establishing these correlations is built. That is what this measurement model is intended to do.

⁷ Life Expectancy Map: New Orleans - Infographic. Robert Wood Johnson Foundation.
<https://www.rwjf.org/en/library/infographics/new-orleans-map.html>.

Appendix B: Why Measure Well-being?

The need to measure health is well-known, but the need to measure well-being has traditionally been less recognized. Well-being is a holistic, positively framed concept that integrates physical, mental, emotional, social, financial, community, and other aspects of life. Well-being is an intrinsically worthy goal for individuals, workplaces, communities, and nations. Findings from multiple studies of different methodologies are converging to support the conclusion that higher well-being leads to longer, healthier lives.

Cantril's Ladder (Self-Anchoring Scale) is a measure of life evaluation, a dimension of well-being (i.e., evaluative well-being) that has been widely used across many different countries and cultures. We recommend using Cantril's Ladder to assess well-being among populations in health care settings, and the evidence cited here focuses primarily on measures of life evaluation and life satisfaction. Life satisfaction, a similar but distinct construct, can also be used to measure evaluative well-being, but is not included in the *Well-being Assessment (12 items - Adult)* or *Well-being Assessment (Youth)*.

Large, cross-sectional population studies at the national and county levels in the US reveal that higher well-being is associated with longer life expectancy. Among a large, representative US sample, a life evaluation that was one standard deviation higher, as measured by Cantril's Self-Anchoring Scale, was associated with 1.5 additional years of life.⁸

Furthermore, a number of prospective cohort studies around the world have shown consistent relationships between well-being and health outcomes, including longevity. Higher self-reported life satisfaction was associated with lower mortality among a nationwide sample of Finnish adults followed for more than 20 years.⁹ An analysis of data from the English Longitudinal Study of Ageing¹⁰ revealed that well-being was associated with increased survival over an average follow-up period of 8.5 years: 29.3 percent of people in the lowest well-being quartile died compared with 9.3 percent of those in the highest quartile. These associations were independent of age, sex, demographic factors, and baseline mental and physical health.

Likewise, data from the Alameda County Study,¹¹ with follow-up over 28 years, showed that after demographics and baseline health were controlled for, higher well-being predicted lower risk of all-cause mortality (RR 0.906; 95 percent CI: 0.867-0.947). Using data from the Gallup-Healthways Well-being Index and national mortality statistics, Graham and Pinto report that the greatest disparities in well-being peak in middle age and match the trends in higher mortality seen among this age group over the past several years.¹² In addition, two separate meta-analyses,^{13, 14} each including data from approximately 35,000 persons, found that higher well-being was associated with lower all-cause mortality and cardiovascular mortality among healthy persons. Furthermore, the presence of high well-being was a predictor of longevity beyond the absence of conditions such as depression.

⁸ Arora A, Spatz E, Herrin J, et al. Population well-being measures help explain geographic disparities in life expectancy at the county level. *Health Affairs (Millwood)*. 2016;35(11):2075-2082. doi:10.1377/hlthaff.2016.0715.

⁹ Koivumaa-Honkanen H, Honkanen R, Viinamäki H, et al. Life satisfaction and suicide: a 20-year follow-up study. *American Journal of Psychiatry*. 2001;158(3):433-439. <https://doi.org/10.1176/appi.ajp.158.3.433>.

¹⁰ Steptoe A, Deaton A, Stone AA. Subjective wellbeing, health, and ageing. *Lancet*. 2015;385(9968):640-648. doi:10.1016/S0140-6736(13)61489-0.

¹¹ Xu J, Roberts RE. The power of positive emotions: It's a matter of life or death—subjective well-being and longevity over 28 years in a general population. *Health Psychology*. 2010;29(1):9-19. <https://doi.org/10.1037/a0016767>.

¹² Graham C, Pinto S. Unequal hopes and lives in the USA: optimism, race, place and premature mortality. *Journal of Population Economics*. 2019;32(2):665-733. doi: 10.1007/s00148-018-0687-y.

¹³ Martín-María N, Miret M, Caballero FF, et al. The impact of subjective well-being on mortality: a meta-analysis of longitudinal studies in the general population. *Psychosomatic Medicine*. 2017;79(5):565-575. doi:10.1097/PSY.0000000000000444.

¹⁴ Chida Y, Steptoe A. Positive psychological well-being and mortality: a quantitative review of prospective observational studies. *Psychosomatic Medicine*. 2008;70(7):741-756. doi:10.1097/PSY.0b013e31818105ba.

In general, the protective effect of well-being was stronger among healthy populations, and effects were diminished among diseased populations. Well-being is also associated with other clinical outcomes and with health-related quality of life. Higher well-being has been linked to lower odds of developing diabetes, while lower well-being predicts cardiovascular disease and cardiovascular-related mortality.

Well-being also is a predictor of lower health care spending and utilization. A US study assessing relative risk of hospital admission or emergency department visits based on individual well-being showed increased risk for a hospital event associated with lower well-being compared with higher well-being.¹⁵ A subsequent population-based US study showed that higher community well-being was associated with lower rates of all-cause, cardiovascular, and respiratory hospital admissions, even after adjusting for sociodemographic characteristics and health care intensity factors.¹⁶ In another population-based US study examining the association between county-level well-being and Medicare spending,¹⁷ higher US county well-being was associated with lower health care spending per Medicare Fee-for-Service beneficiary. This association was independent of urbanicity, median household income, and health care system capacity.

In addition to the evidence linking well-being to lower morbidity, mortality, and health care utilization outcomes, higher well-being also has been linked to better health behaviors and adherence to preventive care. In an analysis of data from the Behavioral Risk Factor Surveillance Survey (2005), higher well-being was associated with lower prevalence of smoking, obesity, physical inactivity, and heavy drinking. Using data from the US Health and Retirement Survey it was shown that higher well-being was also associated with higher likelihood of obtaining preventive care, such as cholesterol and mammography screening.¹⁸ Evidence suggests that higher well-being leads to these better health behaviors. In a large, longitudinal Dutch cohort, higher well-being was associated with engaging in more regular physical activity and eating a healthier diet over a follow-up period of 15 years.¹⁹ Engaging in these healthy behaviors may be one of the mechanisms by which higher well-being leads to longer, healthier lives. In addition, many of these healthy behaviors are key intermediate health outcomes that health care institutions measure and report to the Centers for Medicare and Medicaid Services (CMS) to comply with the Medicare Access and CHIP Reauthorization Act (MACRA) of 2015.

Taken together, these studies suggest that well-being is an important predictor of long-term health and that promoting well-being may help to keep people healthier for a longer period of time. Evidence from a number of smaller studies shows it is possible to improve well-being through positive psychology interventions. In addition, testing through the 100MLives initiative is yielding promising results, demonstrating that interventions to improve domains and determinants of well-being can substantially improve well-being for the targeted population, often within six to 12 months. For example, an intervention to reduce homelessness among women in an urban setting and engage them in healthy behaviors and social connection resulted first in an increase in well-being, followed by improvements in clinical indicators such as blood pressure and hemoglobin A1c.²⁰

¹⁵ Gandy WM, Coberley C, Pope JE, Rula EY. Well-being and employee health: how employees' well-being scores interact with demographic factors to influence risk of hospitalization or an emergency room visit. *Population Health Management*. 2014;17(1):13-20. doi:10.1089/pop.2012.0120.

¹⁶ Roy B, Riley C, Herrin J, et al. Associations between community well-being and hospitalisation rates: results from a cross-sectional study within six US states. *BMJ Open*. 2019;9(11):e030017. doi: 10.1136/bmjopen-2019-030017.

¹⁷ Riley C, Roy B, Herrin J, et al. Association of the overall well-being of a population with health care spending for people 65 years of age or older. *JAMA Network Open*. 2018;1(5):e182136. doi:10.1001/jamanetworkopen.2018.2136.

¹⁸ Kim ES, Kubzansky LD, Smith J. Life satisfaction and use of preventive health care services. *Health Psychology*. 2015;34(7):779-782. doi:10.1037/hea0000174.

¹⁹ Giltay EJ, Kamphuis MH, Kalmijn S, et al. Dispositional optimism and the risk of cardiovascular death: the Zutphen Elderly Study. *Archives of Internal Medicine*. 2006;166(4):431-436. doi:10.1001/archinte.166.4.431.

²⁰ Callendar SCM, Chen S, Edwards P, et al. Improving health outcomes for women experiencing homelessness in the Skid Row community of Los Angeles. *Downtown Women's Center*; 2017.

We expect the well-being assessments to inform clinical practice in ways that can improve outcomes and streamline processes. We also expect that the use of the well-being assessment could lead to changes in how the clinic and patients interact. During testing and implementation of these items in multiple, diverse communities across the US through 100MLives as well as other independent community-engaged research collaboratives, people indicated that the items in our well-being assessments were easy to complete, highly relevant, and joy-producing. They stated appreciation for the opportunity to provide information that actually matters to them.

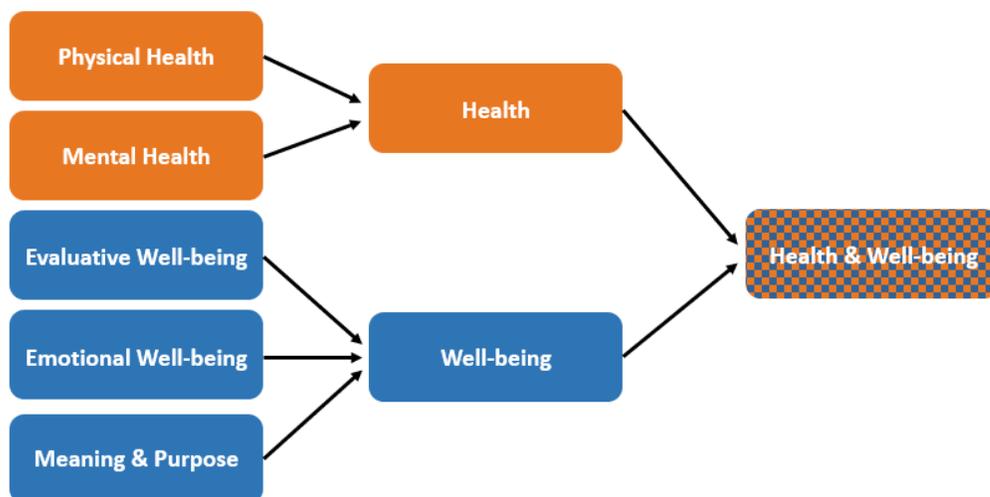
Appendix C: 100 Million Healthier Lives Theory of Change

“Health and well-being” is a broad and interconnected construct. Good physical and mental health contribute directly and indirectly to a person’s well-being. People in good physical and mental health may have better states of well-being than people in poorer health. Further, people in good physical and mental health also are more able to engage socially and participate in civic and spiritual activities that also contribute to well-being, resembling an upward spiral in this sense, physical and mental health also are determinants of well-being.²¹

Similarly, good well-being (financial, social, etc.) can contribute to improved physical and mental health. If a person has sufficient financial stability to afford leisure time and a gym membership, it’s easier for them to engage in activities to improve physical health. If a person has strong social connections, and finds purpose in their life, they may feel more empowered to reach out for help when their mental health suffers.

We also recognize that the length of a person’s life is an important contributor to his or her health; the longer a person experiences the dimensions of well-being, the healthier is his or her life. To reflect this, we are working to combine well-being and life expectancy into “well-being–adjusted life-years,” similar to the construct of quality-adjusted life-years used in health services research.

In the health care system or clinical setting, a theory of change, as captured by a driver diagram, may be helpful to explore what may be influencing your patient’s or population’s well-being. For example, at the individual level, a patient’s access to basic needs, quality of social connections, and engagement in meaningful activities, among other things, may affect their well-being score. At the community or population level, factors like social cohesion, walkability of neighborhoods, or housing availability, among other things, may affect a population’s well-being.



²¹ Van Cappellen P, Rice EL, Catalino LI, Fredrickson BL. Positive affective processes underlie positive health behaviour change. *Psychology & Health*. 2018;33(1):77–97. <https://doi.org/10.1080/08870446.2017.1320798>.

Appendix D: Well-being Assessment (Adult - 12 items) - 100 Million Healthier Lives Sociodemographic Items

S1. What is your gender?

- Man
- Woman
- Transgender Man
- Transgender Woman
- Nonbinary
- Other _____
- Prefer Not to Identify

S2. What is your age? _____ years

Please answer the question about Hispanic, Latino, and/or Spanish origin, the question about Middle Eastern and/or North African origin, **AND** the question about race. For this survey, Hispanic, Latino, and/or Spanish origins and Middle Eastern and/or North African origins are not races.

S3. Are you of Hispanic, Latino, and/or Spanish origin?

- No, not of Hispanic, Latino, or Spanish origin
- Yes, of Hispanic, Latino, and/or Spanish origin

S4. Are you of Middle Eastern and/or North African origin?

- No, not of Middle Eastern or North African origin
- Yes, of Middle Eastern and/or North African origin

S5. Which one or more of the following would you say is your race (select all that apply)?

- American Indian or Alaska Native
- Asian
- Black or African American
- Pacific Islander
- White
- Other

S6. What is the highest grade or level of education you completed?

- Never attended school or only attended kindergarten
- Grades 1-8
- Some high school
- High school degree or GED
- Some college or technical school
- College degree
- Some postgraduate
- Postgraduate degree

S7. What is the ZIP Code where you live? _____

Appendix E: Well-Being Assessment (Adult - 12 items) - 100 Million Healthier Lives Item Sources

Item	Source	Any Modifications?
I. Life Satisfaction and Life Evaluation		
Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?	<p>Cantril, H. (1965). The pattern of human concerns. New Brunswick, NJ: Rutgers University Press.</p> <p>Used in Gallup-Healthways Well-Being Index (US) and RWJF Culture of Health Survey. Gallup. (2014). Gallup daily methodology. Retrieved from: link</p>	Wording is that used in the Gallup Healthways Index (2014)/ Gallup-Sharecare Well-Being Index
On which step do you think you will stand about five years from now?	<p>Cantril, H. (1965). The pattern of human concerns. New Brunswick, NJ: Rutgers University Press.</p> <p>Used in Gallup-Healthways Well-Being Index (US) and RWJF Culture of Health Survey. Gallup. (2014). Gallup daily methodology. Retrieved from: link</p>	Wording is that used in the Gallup Healthways Index (2014)
II. Physical Health, Mental Health, and Physical Function		
In general, how would you rate your physical health?	<p>Patient-Reported Outcomes Measurement Information System. (2016). PROMIS scale v1.2 - Global physical 2a. Retrieved from: link</p>	

Item	Source	Any Modifications?
<p>How would you rate your overall mental health?</p>	<p>Consumer Assessment of Healthcare Providers and Systems. (2016). CAHPS health plan survey: Overview of the questionnaires. Retrieved from: link</p> <p>1. “In general, how would you rate your overall mental health now?” is in the following CAHPS surveys:</p> <ul style="list-style-type: none"> •Mental Health Care Surveys: Experience of Care and Health Outcomes (ECHO) Survey (Adult and Child--asks about how parent would rate their child’s overall mental health now) <p>2. “In general, how would you rate your overall mental and emotional health?” is in the following CAHPS surveys:</p> <ul style="list-style-type: none"> •Health Plan Survey •Clinician & Group Survey (CG-CAHPS) •Hospital Survey (HCAHPS) •Home Health Care Survey •In-Center Hemodialysis Survey •Surgical Care Survey •American Indian Survey <p>3. Neither of these are in the following CAHPS surveys:</p> <ul style="list-style-type: none"> •Nursing Home Surveys Long-Stay Resident Survey (Discharged Resident Survey & Family Member Survey) •Dental Plan Survey 	<p>Original wording was, "In general, how would you rate your overall mental or emotional health?" Revision (i.e., removing "or emotional") made due to it being a double-barreled. The introduction, "In general," was removed to be in line with wording in VanderWeele Flourishing Scale. Asking only about mental health also is in line with the Flourishing Scale.</p>
<p>For at least the past 6 months, to what extent have you been limited because of a health problem in activities people usually do?</p>	<p>Global Activity Limitation Instrument (GALI) by Euro-REVES project. Eurostat. (2016). Glossary: Activity limitation. Retrieved from: link</p>	
<p>IV. Meaning and Purpose</p>		
<p>I have a sense of direction and purpose in life.</p>	<p>Ryff, C. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. <i>Journal of Personality and Social Psychology</i>, 57, 1069–1081. Retrieved from: link</p> <p>See also: link</p>	

Item	Source	Any Modifications?
V. Relationships		
How often do you feel lonely?	Campaign to End Loneliness. (n.d.). The Campaign to End Loneliness measurement tool. Measuring your impact on loneliness in later life, 11-13. Retrieved from: link	
VI. Community and Social Support		
How would you describe your sense of belonging to your local community?	Canadian Community Health Survey (CCHS) 2018; Statistics Canada; link Victoria Foundation (2010). The Greater Victoria Wellbeing Survey. Retrieved from: link (on page 9)	
If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?	Gallup. (2008). World Poll questions. Retrieved from: link (from the Citizen Engagement Index in Gallup World Poll page 21)	
VI. Financial Health and Vitality		
Now imagine the top of the ladder represents the best possible financial situation for you, and the bottom of the ladder represents the worst possible financial situation for you. Please indicate where on the ladder you stand right now.	Adapted from Cantril, H. (1965). The pattern of human concerns. New Brunswick, NJ: Rutgers University Press. Used by Gallup-Healthways and RWJF Culture of Health Survey. Porter, N. M., & Garman, E. T. (1993). Testing a conceptual model of financial well-being. Financial Counseling and Planning, 4, 135–165. Retrieved from: link	

Item	Source	Any Modifications?
<p>VIII. Affect</p> <p>During the past two weeks, how often have you experienced positive emotions such as joy, affection, or hope?</p>	<p>Adapted from SPANE Scale in Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. <i>Social Indicators Research</i>, 97, 143-156. https://doi.org/10.1007/s11205-009-9493-y. Retrieved from: link</p> <p>Bjalkebring, P., Västfjäll, D., & Johansson, B. E. A. (2015). Happiness and arousal: Framing happiness as arousing results in lower happiness ratings for older adults. <i>Frontiers in Psychology</i>, 6, 1-5. https://doi.org/10.3389/fpsyg.2015.00706</p> <p>Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. <i>American Psychologist</i>, 56, 218–226. https://doi.org/10.1037/0003-066X.56.3.218</p> <p>Fredrickson, B. L. (2009). <i>Positivity</i>. New York, NY: Crown.</p> <p>Hepach, R., Kliemann, D., Grüneisen, S., Heekeren, H.R., & Dziobek, I. (2011). Conceptualizing emotions along the dimensions of valence, arousal, and communicative frequency – implications for social-cognitive tests and training tools. <i>Frontiers in Psychology</i>, 2, 1-9. doi: 10.3389/fpsyg.2011.00266. eCollection 2011.</p> <p>Lim, N. (2016). Cultural differences in emotion: Differences in emotional arousal level between the East and the West. <i>Integrative Medicine Research</i>, 5, 105-109. https://doi.org/10.1016/j.imr.2016.03.004</p> <p>McManus, M. D., Siegel, J. T., & Nakamura, J. (2018).. The predictive power of low-arousal positive affect. <i>Motivation and Emotion</i>, 43, 130-144. https://doi.org/10.1007/s11031-018-9719-x</p>	<p>Rather than using a 4-week time frame in the SPANE, we utilized a 2-week time frame similar to depression inventories (e.g., Beck Depression Inventory-II). This also would be easier for respondents in terms of recall accuracy and the amount of cognitive effort required to answer the question. SPANE asks about feeling "positive", so we used this to try to capture overall positive emotion (rather than solely focus on a discrete positive emotion). Asking about one discrete positive emotion and not others could mean we miss out on capturing how positive one really felt in the last two weeks. We turned this "positive" item into a question format. We then added these examples to help clarify what we meant for "positive" for the respondent.</p> <p>Joy and hope are in Fredrickson's (2009) "Big 10" list of positive emotions and are both considered high-arousal/high-activation positive emotions (see Fredrickson, 2001, and OCC Model of emotions). Affection is categorized as a low-arousal, positive emotion (Hepach, Kliemann, Gruneisen, Heekeren, & Dziobek, 2011). Hepach et al. published their article on social-cognitive testing of 62 different emotions regarding their levels of arousal, valence, and frequency which provides support for affection. This combination of examples represent both high-arousal (joy and hope) and low-arousal (affection) positive emotions that balanced out the high- and low-arousal nature of the negative emotion items: affection and sadness (low-arousal positive and negative), joy and worry (high-arousal positive and negative), and hope and despair (future outlook positive and negative and high-arousal).</p> <p>We needed to highlight both high- and low-arousal positive emotions in line with experts in the field of positive emotion (see Shiota et al., 2017). In the positive emotion literature, there is evidence to suggest that eastern or collectivist cultures value more low-arousal positive</p>

Item	Source	Any Modifications?
	<p>Ortony, A., Clore, G.L., Collins, A. (1988). <i>The Cognitive Structure of Emotions</i>. Cambridge University Press, Cambridge, UK.</p> <p>Diez Roux A. V. (2017). Despair as a Cause of Death: More Complex Than It First Appears. <i>American journal of public health</i>, 107(10), 1566–1567. https://doi.org/10.2105/AJPH.2017.304041</p>	<p>emotions and prefer to experience low-arousal over high-arousal positive emotions (Lim, 2016). Including a low-arousal example may make the item more relevant to and inclusive of multiple cultures. There also is evidence for potential age differences; in one study that used highly differentiated manipulations, adults > 55 years rated their happiness lower when it was framed using high-arousal versus low-arousal frame (Bjalkebring, Vastfjall, & Johansson, 2015). McManus, Siegel, and Nakamura (2018) also underscore that it is important to ask about high-arousal positive emotions, as low-arousal positive emotions can account for additional variance beyond high-arousal positive emotions. Also, higher levels of trait hope are associated with lower prevalence of hypertension and diabetes and a lower incidence rate of respiratory tract infections (Richman et al., 2005). (Note: The “Big 10” are joy, gratitude, serenity, interest, hope, pride, amusement, inspiration, awe, and love.)</p>
<p>During the past two weeks, how often have you experienced negative emotions such as sadness, worry, or despair?</p>	<p>Adapted from SPANE Scale in Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. <i>Social Indicators Research</i>, 97, 143-156. https://doi.org/10.1007/s11205-009-9493-y. Retrieved from: link</p> <p>Eckman's work on universal emotions: link</p> <p>Ekman, P. (1977). Facial Expression. In Siegman, A. & Feldstein, S. (Eds.), <i>Nonverbal Communication and Behavior</i> (pp. 97-126). New Jersey: Lawrence Erlbaum Association.</p> <p>Ekman, P. (1999). Basic Emotions. In T. Dalgleish and M. Power (Eds.), <i>Handbook of Cognition and Emotion</i> (Chapter 3). Sussex, U.K.: John Wiley & Sons, Ltd.</p> <p>Gallup. (2008). World Poll questions.</p>	<p>Rather than using a 4-week time frame in the SPANE, we utilized a 2-week time frame similar to depression inventories (e.g., Beck Depression Inventory-II). This also would be easier for respondents in terms of recall accuracy and the amount of cognitive effort required to answer the question. SPANE asks about feeling "negative", so we used this to try to capture overall negative emotion (rather than solely focus on a discrete negative emotion). Asking about one discrete negative emotion and not others could mean we miss out on capturing how negative one really felt in the last two weeks. We turned this "negative" item into a question format.</p> <p>Sadness has been classified as a principle negative emotion (Eckman, 1977, 1999, 2019[website]) and is low-arousal (think symptom of depression). Worry was selected, as it has been included over the years in Gallup's World Poll and Sharecare Health Index. Despair is categorized as a high-arousal, positive</p>

Item	Source	Any Modifications?
	<p>Retrieved from: link</p> <p>Hepach, R., Kliemann, D., Grüneisen, S., Heekeren, H.R., & Dziobek, I. (2011). Conceptualizing emotions along the dimensions of valence, arousal, and communicative frequency – implications for social-cognitive tests and training tools. <i>Frontiers in Psychology</i>, 2, 1-9. doi: 10.3389/fpsyg.2011.00266. eCollection 2011.</p>	<p>emotion (Hepach, Kliemann, Gruneisen, Heekeren, & Dziobek, 2011). Hepach et al. published their article on social-cognitive testing of 62 different emotions regarding their levels of arousal, valence, and frequency which provides support for affection. This combination of examples balanced out the high- and low-arousal nature of the positive emotion items: affection and sadness (low-arousal positive and negative), joy and worry (high-arousal positive and negative), and hope and despair (future outlook positive and negative and high-arousal).</p>

Appendix F: Versions of the Well-being Assessment (Adult – 12 items) 100 Million Healthier Lives

The initial version of this assessment, then called the *Adult Well-being Assessment*, was published in 2016. Throughout the following several years, the Metrics Team collected feedback from those implementing the assessment and continued to follow advances in well-being theory and measurement. Through this process, we identified areas for improvement in our original well-being assessment. The mental health item did not test well and was double-barreled. The social and emotional support item also was double-barreled, and did not fully encompass and describe the concepts. Social and emotional well-being also emerged in the literature as being more significant than was reflected in the initial assessment, especially as deaths of despair and social isolation have risen.²² Physical function also emerged as an individual item differentiated from physical health. Based on these learnings, the Metrics Team began the process of updating the assessment in 2019.

In the interest of keeping the assessment brief, the first version contained only seven items. Feedback from initial users showed that assessment takers were comfortable with a slightly longer assessment, so this updated version has been expanded to better match the current understanding of well-being and its domains. The mental health question (item 4) was simplified and a physical function item (item 5) was added. Items measuring relationships (item 8) and social and community support (items 9 and 10) were updated and expanded. The double-barreled mental health question in the first version, which included a reference to mood, was replaced with a new mental health-specific item, as well as two items measuring positive and negative affect (items 11 and 12). Additionally, all items were converted to a 0-10 Likert-style scale for consistency and to track changes over time in greater detail.

Individuals, organizations, and communities who utilized the first version of the assessment may switch to this updated version and maintain some continuity. The life evaluation Cantril's Ladder questions were preserved across the two versions, and users can use data across versions continuously.

²² Diez Roux AV. Despair as a cause of death: more complex than it first appears. *American Journal of Public Health*. 2017;107(10):1566–1567. <https://doi.org/10.2105/AJPH.2017.304041>.

Appendix G: Attribution and Citation for the Well-being Assessments

For Well-being Assessment (Adult - 12 items) - 100 Million Healthier Lives



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Attribute to:

Matthew C. Stiefel, MPA, MS, Senior Director, Center for Population Health, Kaiser Permanente
 Carley L. Riley, MD, MPP, MHS, FAAP, Assistant Professor, University of Cincinnati Department of Pediatrics; Attending Physician, Cincinnati Children's Hospital
 Brita Roy, MD, MPH, MHS, Assistant Professor, Yale Schools of Medicine and Public Health; Director of Population Health, Yale Medicine
 Tasha Straszewski, PhD, MA, Data Analyst Graduate Intern, Center for Population Health, Kaiser Permanente.
 100 Million Healthier Lives, convened by the Institute for Healthcare Improvement

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For Well-being Assessment (Youth) - 100 Million Healthier Lives



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Attribute to:

Matthew C. Stiefel, MPA, MS, Senior Director, Center for Population Health, Kaiser Permanente
 Carley L. Riley, MD, MPP, MHS, FAAP, Assistant Professor, University of Cincinnati Department of Pediatrics; Attending Physician, Cincinnati Children's Hospital
 Brita Roy, MD, MPH, MHS, Assistant Professor, Yale Schools of Medicine and Public Health; Director of Population Health, Yale Medicine
 100 Million Healthier Lives, convened by the Institute for Healthcare Improvement

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Appendix H: Well-Being Assessment (Youth) – 100 Million Healthier Lives Item Sources

ChildTrends²³ (items 3, 4, 6, 7, and 9): The Flourishing Children Project was created to measure 19 constructs of positive youth development in categories including flourishing in relationships, relationship skills, flourishing in school and work, helping others to flourish, environmental stewardship, and personal flourishing. Each scale was intended to be used alone or in combination in the event that other measures are not available. The items that are used in our tool relate to cognitive well-being, meaning and purpose, and social well-being domains.

Sense of Community Index²⁴ (item 5): The Sense of Community Index (SCI) is a 12-item scale most commonly used in social sciences to assess one’s sense of community, or rather “a perception with an affective component.” Individuals rank each item as true or false. These items are further broken down into the subscales: Membership, Influence, Reinforcement of Needs, and Shared Emotional Connection. The SCI has shown to be a strong predictor of behaviors (such as volunteering) and health and community outcomes. The modified item used in this Youth Well-being Assessment Tool captures the general value of one’s community to oneself.

Short Grit Scale²⁵ (item 8): These items were drawn from the Short Grit Scale, which is composed of 8 items measuring trait-level perseverance and passion for long-term goals. Grit-S has shown to longitudinally predict GPA and, inversely, TV screen time in youth. Items in this scale can be grouped into two categories: Consistency of Interest and Perseverance of Effort.

Gallup Student Poll²⁶ (item 9): The Gallup Student Poll is given to students from grades 5 through 12 to measure hope, engagement, and well-being. Scoring includes responses from 20 items. In our assessment tool, we inquire about the presence of an adult who cares about one’s future (measuring both social well-being and hope constructs).

PROMIS²⁷ (items 10 and 11): The PROMIS (Patient-Reported Outcomes Measurement Information System) Global Health pediatric instrument is a 7-item scale used to measure a child’s overall, general assessment of their physical, mental, and social health (as opposed to specific disease states). The measure includes a single factor and global health score. In terms of our tool, we included items to assess general evaluations of personal emotional and physical health. Importantly, we modified the emotional health item based on consistent feedback from pilot testing.

²³ Lippman L, et al. *Flourishing Children*. SpringerBriefs in Well-Being and Quality of Life Research; 2014. <http://www.springer.com/us/book/9789401786065>.

²⁴ Chavis DM, Lee KS, Acosta JD. The Sense of Community (SCI) Revised: The Reliability and Validity of the SCI-2. Paper presented at the 2nd International Community Psychology Conference. Lisboa, Portugal; 2008.

²⁵ Duckworth AL, Quinn PD. Development and validation of the Short Grit Scale (GritS). *Journal of Personality Assessment*. 2009; 91:166-174.

²⁶ Measuring Student Hope, Engagement, and Well-Being: Gallup. www.gallupstudentpoll.com.

²⁷ PROMIS Pediatric Instrument Banks. National Institutes of Health. <https://www.niams.nih.gov/ko/node/1371#topic-1>.

Appendix I: Scoring the Well-being Assessment (Adult – 12 items) - 100 Million Healthier Lives

The 100 Million Healthier Lives Well-being Assessment (Adult) - 12-items measure includes three items related to health (*physical health, mental health, and physical function*) and nine items related to well-being (*current and future life evaluation, financial well-being, purpose, relationships, community and social support, and affect*). As opposed to combining all of the items to calculate one overall well-being score, we recommend calculating one composite, Life Evaluation. We have also included Affect Balance as an additional composite, which provides a ratio of positive emotion to negative emotion in one's life. Each individual item can then be examined to assess and understand areas of strength or need to which communities and organizations may respond. All items are scored on 11-point, Likert-style scales, which were selected for consistency and to track changes over time in greater detail.

As listed below, most items should be scored using the original response set direction. For three of them, scores need to be reversed. To reverse-code these items, a respondent's score is subtracted from the maximum score of 10; see table below for details.

Score Using the Original Response Set Direction	Score Using Reverse Coding
<ul style="list-style-type: none"> • Current life evaluation (item 1) • Future life evaluation (item 2) • Financial well-being (item 3) • Physical health (item 4) • Mental health (item 5) • Purpose (item 7) • Sense of belonging to one's community (item 9) • Social support (item 10) • Positive emotion (item 11) 	<ul style="list-style-type: none"> • Physical function (item 6) • Loneliness (item 8) • Negative emotion (item 12)

Original Response	0	1	2	3	4	5	6	7	8	9	10
Reverse Coded Response	10	9	8	7	6	5	4	3	2	1	0

Composites

Overall life evaluation is measured using responses to the 2-item Cantril's Ladder Self-Anchoring Scale, which ranges from 0 (worst possible) to 10 (best possible) as an indicator of current life evaluation and future life evaluation. Responses are combined to create a composite with which individuals are categorized as *Thriving*, *Struggling*, or *Suffering* based on an algorithm established and validated by Gallup.²⁸ Individuals who score 7 or higher on *current life evaluation* (item 1) and 8 or higher on *future life evaluation* (item 2) are categorized as *Thriving* (i.e., "well-being that is strong, consistent, and progressing"; Gallup, 2020). Individuals who score 4 or lower on both *current life satisfaction* (item 1) and *future life evaluation* (optimism) (item 2) are categorized as *Suffering* (i.e., "well-being that is at high risk").⁷ All others are categorized as *Struggling* (i.e., "well-being that is moderate or inconsistent").

Affect balance, a concept developed by Diener and Biswas-Diener (2009), is measured using the two affect items that measure frequency of positive and negative emotional experiences during the last two weeks (items 11 and 12), ranging from 0 (*Never*) to 10 (*All of the time*). To develop these items, we

²⁸ Understanding How Gallup Uses the Cantril Scale. <https://news.gallup.com/poll/122453/understanding-gallup-uses-cantril-scale.aspx>.

combined the overall positive and negative categories from the Scale of Positive and Negative Experience scale,²⁹ the two-week time frame used to capture depressive symptomatology (e.g., Beck Depression Inventory-II, Beck et al., 1996; Patient Health Questionnaire [PHQ-9],³⁰ and the examples of both high- and low-arousal positive emotions from the emotion literature^{31,32,33} and Gallup World Poll³⁴ and Gallup-Sharecare Well-Being Index.³⁵ This combination of examples was selected to present a balance of high-arousal and low-arousal positive and negative emotions: affection and sadness (low-arousal positive and negative), joy and worry (high-arousal positive and negative), and hope and despair (high-arousal positive and negative, both future-oriented). To calculate an affect balance score, the negative emotion response is subtracted from the positive emotion response. Higher scores represent a greater prevalence of positive, as opposed to negative, emotional experiences.

²⁹ Diener E, Biswas-Diener R. Scale of Positive and Negative Experience (SPANE); 2009.

[http://labs.psychology.illinois.edu/~ediener/Documents/Scale of Positive and Negative Experience.pdf](http://labs.psychology.illinois.edu/~ediener/Documents/Scale%20of%20Positive%20and%20Negative%20Experience.pdf).

³⁰ Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*. 2001;16(9):606-613.

³¹ Ekman P. "Facial Expression." In Siegman A & Feldstein S. (eds.), *Nonverbal Communication and Behavior*. New Jersey: Lawrence Erlbaum Association; 1977.

³² Fredrickson BL. *Positivity*. New York: Three Rivers Press; 2009.

³³ Hepach R, Kliemann D, Grüneisen S, et al. Conceptualizing emotions along the dimensions of valence, arousal, and communicative frequency – implications for social-cognitive tests and training tools. *Frontiers in Psychology*. 2011;2:266. doi: 10.3389/fpsyg.2011.00266.

³⁴ What If You Were the Leading Source? Gallup. <https://www.gallup.com/analytics/232838/world-poll.aspx>.

³⁵ Gallup-Sharecare Well-Being Index - Sharecare. <https://www.sharecare.com/static/well-being-index>.

Appendix J: Sampling

Target Population, Subpopulations, and Equity

The *target population* is the whole group of people that your program aims to impact. It could be a specific demographic or cultural group of people that enrolls in or is expected to be reached a program. Examples include homeless individuals enrolled in a housing-first program or all adults living in Fairfield County targeted to be reached through a media campaign. A *sample* is a subset of the target population. Samples can be used to estimate what the target population is like without having to ask every single member of that population. Samples can be gathered in different ways, such as using random sampling or convenience sampling. However, some sampling methods are better than others. Random samples are preferred; if done correctly they should be more representative of the target population than non-random samples.

Sometimes, there are *subpopulations* within a target population. For example, if a program is performing outreach and providing support for families in a given neighborhood, it may be useful to measure outcomes in both children and adults within those families. In that case, the children would be one subpopulation and adults another subpopulation. If you have subpopulations, you'll need to have a sampling strategy that incorporates each subpopulation appropriately (see sampling, below). See also the section on stratified random sampling in this resource: <http://www.stat.yale.edu/Courses/1997-98/101/sample.htm>.

To measure equity in outcomes achieved, it is important to ensure that the specified demographic groups for equity (subpopulations) within your target population are proportionally included in the sample. For example, if your equity categories are gender, ethnicity, and age, and the target population includes 50 percent women, 30 percent Hispanic, and 10 percent above the age of 65, your sample should have approximately the same representation, and a sufficient sample size in each group (see below).

Sampling

	Population (whole)	Random Sample	Convenience Sample
Description	Every member of a cohort, organization, or community	Subset of individuals from a population, determined by a process through which each individual has the same probability of being chosen and each individual is chosen entirely by chance	Subset of individuals from a population, chosen because they are easy to reach or close at hand
Cost	Most expensive	Moderately expensive	Least expensive
Information Provided	Can track changes in individuals and the overall population over time	Can estimate and track changes in the population over time using a smaller number of people. The extent to which the results are	Can only track changes in the individuals sampled, if information for follow-up is available. Cannot make

		representative of the population parameters depends on the size of the sample and whether true random sampling was utilized.	generalizations about the entire population.
Use	When it is important to track all individuals in the population	When it is important to track changes in the population but not individuals	When quick and easy survey information is needed, especially during early design and testing
Issues	Difficult for large populations. Difficult to follow all individuals over time due to participant drop-out.	It may be difficult to have true random sampling (i.e., all individuals having an equal chance of being selected to participate), especially if trying to obtain the same number of participants across different sociodemographic categories. However, you could still try to use simple random sampling within each of the categories.	Results may not truly reflect the population parameter, thereby being potentially misleading

Creating a Random Sample

It can be challenging to create a truly random sample, but, it is necessary in order to allow for generalization to the population. There are many tools for creating a random sample, including a lottery, random number generator, or computer software program. Further information can be found at <http://www.stat.yale.edu/Courses/1997-98/101/sample.htm>.

Sample Size Calculation for Random Sampling

To determine how big of a sample you need (sample size), the first step is to know the type of study you are conducting and the type of outcome variable you are interested in examining. Below is an overview. For a more detailed account, please see <http://www.columbia.edu/~mvp19/RMC/M6/M6.doc>.

1) Is the study *descriptive* or is it *comparative*?

Descriptive studies look at a single population at a single point in time and are used to provide an estimation of rates, proportions, or means of a population. For example, organizations may be interested in identifying the average level of social support for an entire community using a simple random sample as an estimation. Organizations also may be interested in identifying the proportion of members that are thriving, using a simple random sample drawn from this community. Sample size for these types of studies is determined used confidence intervals.

Comparative studies are used to examine whether there are significant differences between two or more groups. For example, organizations may be interested in comparing the average level of

social support across two neighboring communities and may take a simple random sample from each community to examine whether these communities do in fact differ from each other more than what we would expect by chance. Comparative studies also can be used to test the effectiveness of an intervention, such as when comparing pre-intervention scores on well-being to post-intervention scores; these types of studies can be designed as a between-groups design (the sample in the pre-intervention and post-intervention are not necessarily the same individuals) or within-groups design (when comparing the same participants' pre-intervention measures at Time 1 to their post-intervention measures at Time 2).

- 2) Is the outcome of interest a *numeric* (interval or ratio) or a *categorical* (nominal or ordinal) variable?

Numeric variables are measured using a pre-determined scale. These include interval variables that have Likert-style, response scales (e.g., 1, *Strongly disagree*, to 10, *Strongly agree*) where the distance between the intervals is assumed to be equal, and there is no meaningful zero. Ratio variables also are numeric and differ from interval variables in that they have a true, meaningful zero. Ratio variables include discrete variables, which use whole numbers (e.g., number of children, number of cars), and continuous variables that can include numbers with decimals (e.g., weight, time). Means and standard deviations are typically reported for numeric variables.

Categorical (or qualitative) variables can have two or more categories to which a person may be classified. This includes nominal variables, where the order of the categories does not matter (e.g., gender, ethnicity) and ordinal variables (e.g., year in school) where order does matter. When using categorical variables as key outcomes, the percentage of people that fall into a specific category is typically the data reported.

After you establish the type of study and type of outcome variable you will be using, the next step is to determine an appropriate sample size. You can find some resources in the table below to help you calculate the sample size for your study depending on the type of study you're doing and type of outcome measure you have. For a more detailed account, please see <http://www.columbia.edu/~mvp19/RMC/M6/M6.doc>. You may consider connecting with a local academic institution or your local health department to help connect you with a statistician for some help with this, as many are willing to partner or have resources available for public use.

As an additional consideration, if you plan to collect data at multiple points over time or conduct follow-up studies, it is important to take participant dropout into consideration. If dropout is likely, sample sizes should be larger than the minimum needed based on sample size calculations. Estimations of drop-out rates may be determined by examining prior, similar studies.

Sample Size Calculation Resources

		Type of Study	
		Descriptive	Comparative
Type of Outcome Variable	Numeric	<p>https://www.surveysystem.com/sscalc.htm</p> <p>Note: The term “confidence interval” in the first box should be labeled “margin of error” (Berkowitz & Lynch, n.d.)</p>	<p>https://stats.idre.ucla.edu/other/gpower/</p> <p>Note: To determine the appropriate sample size calculator from the list in this link you need to determine whether 1) you are comparing one sample statistic to an existing population parameter (e.g., a known mean) to test if there is something special about your sample that it is significantly different from the population from which it was drawn, or 2) you are comparing two (or more) sample statistics to each other to test if these samples are indeed different enough to conclude they are indeed drawn from two different populations. You can explore these options listed (with the exception of the two independent proportions that is included in the cell below).</p>
	Categorical	<p>https://www.surveysystem.com/sscalc.htm</p> <p>Note: The term “confidence interval” in the first box should be labeled “margin of error” (Berkowitz & Lynch,)</p>	<p>https://stats.idre.ucla.edu/other/gpower/two-independent-proportions-power-analysis/</p>

Additionally, when you begin to think about your data analytic plan, you can visit this following interactive source to help you identify the appropriate analytical technique for your study:

<https://sites.utexas.edu/sos/guided/inferential/>

Glossary

Baseline assessment	First episode of data collection, represents the starting point for your measurement
Confidence interval	Plus-or-minus figure usually reported in survey results (also called margin of error)
Confidence level	Expressed as a percentage, represents how often the true percentage of the population who would pick an answer lies within the confidence interval

Convenience sample	Subset of individuals from a population, chosen because they are easy to reach or close at hand
Follow-up assessment	Episodes of data collection after the baseline assessment, performed at regular intervals during the course of a program or intervention
Random sample	Subset of individuals from a population that can approximate the entire population, determined by a process through which each individual has the same probability of being chosen and each individual is chosen entirely by chance
Subpopulations	Subset of individuals from a population
Target population	Group of people that a program aims to impact, such as a specific demographic or cultural group of people that enrolls in or is expected to be reached by a program
Whole cohort	Every member of a population