Stanford WELL for Life
YEAR IN REVIEW
2020
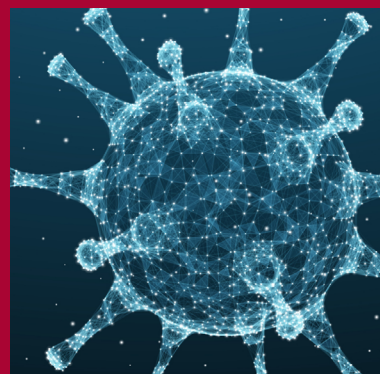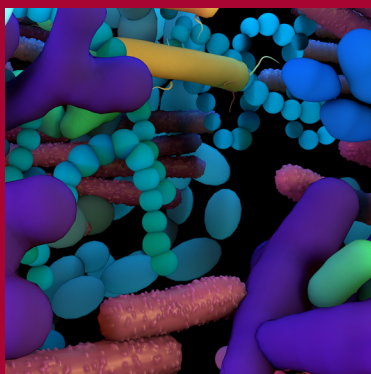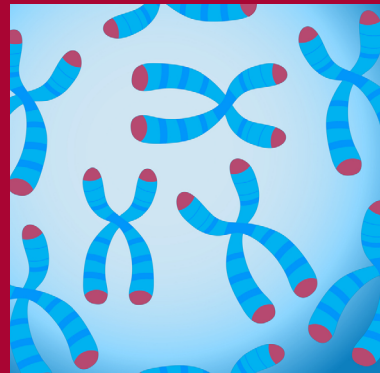
Accelerating the Science of Well-Being

Stanford | MEDICINE

A Global Study to Understand, Measure, and Promote Well-Being
N=30,715

WELL Bay Area
6,164

WELL China
10,218

WELL Taiwan
3,033

WELL Thailand
2,000

WELL Singapore
9,300

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Gratitude

This has been a challenging year for all of us, yet we have so much to be thankful for. I have seen so much kindness and humanity from everyone in our WELL community. Our participants opened their hearts and shared their concerns with us in many surveys, provided input to help improve WELL, and poured in their support to encourage and lift our spirits. Some of our participants even stepped up to offer tangible help, including sharing their executive skills to help WELL grow effectively while others connected us with folks with resources to help improve our financial health.

Gratitude unlocks the fullness of life. On behalf of the WELL team, I give thanks to our participants, colleagues, friends, and donors for your encouragement and support. You are our best partners in the pursuit of truth and well-being. Because of you, we remain optimistic and resilient.

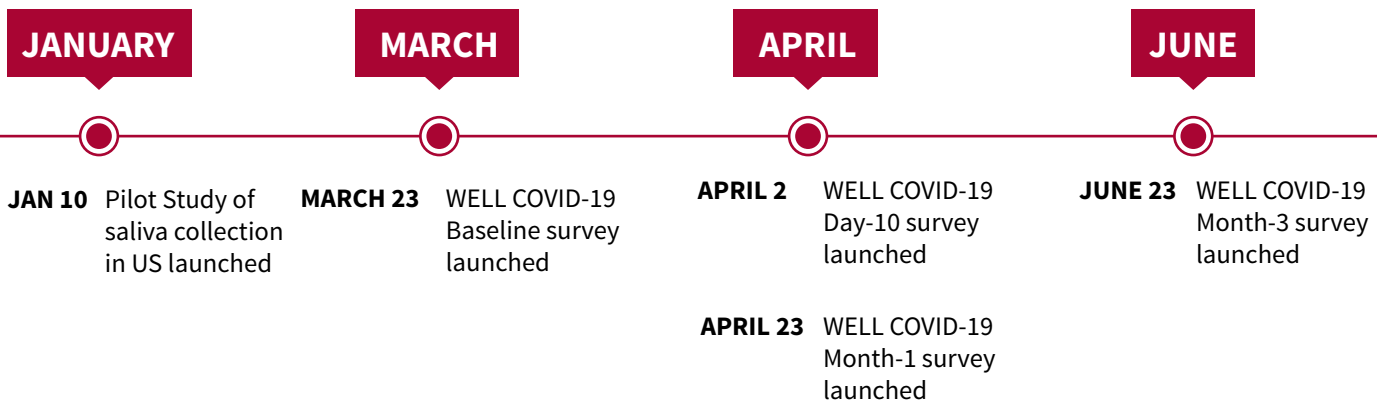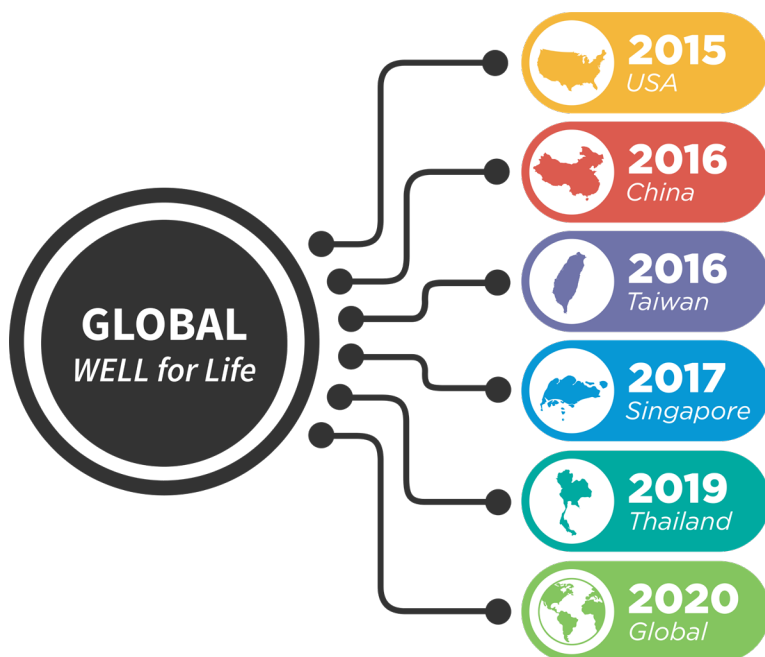*Ann Hsing, PhD, PI, Stanford WELL for Life Study*

What is Stanford WELL for Life?

Stanford WELL for Life (WELL) is a global longitudinal study that uses novel methods to understand, measure, and promote multiple dimensions of well-being across countries and cultures. For the past five years, WELL's multidisciplinary team of experts has been studying over 30,000 participants from the U.S., China, Taiwan, Singapore, and Thailand to understand and measure well-being—the synthesis of each person's biological, psychological, and spiritual experiences.

2020
AT A GLANCE

During this year of unprecedented global disease and distress, it is more important than ever to proactively improve and sustain well-being for people around the world. While this year has been challenging, the WELL team has done all we can to adapt and redouble our efforts. In the U.S. and China, we launched a longitudinal COVID-19 study with our WELL community to understand the impact of the pandemic and its requisite social isolation, and deepened our ties with the WELL community through continual support and communications. We also published novel research, participated in new collaborations, launched our online WELL Global Study, advanced our research in Thailand, China, and Singapore, and conducted several pilot studies to set the stage for bigger studies to come. See the timeline below for more details.

JANUARY　　　**MARCH**　　　**APRIL**　　　**JUNE**

JAN 10 Pilot Study of saliva collection in US launched

MARCH 23 WELL COVID-19 Baseline survey launched

APRIL 2 WELL COVID-19 Day-10 survey launched

APRIL 23 WELL COVID-19 Month-1 survey launched

JUNE 23 WELL COVID-19 Month-3 survey launched

GLOBAL *WELL for Life*

- 2015 USA
- 2016 China
- 2016 Taiwan
- 2017 Singapore
- 2019 Thailand
- 2020 Global

30,000 *participants*

1,000 *variables for each participant*

300,000 *banked specimens*

SEPTEMBER

SEPT 23 WELL COVID-19 Month-6 survey launched

SEPT 23 Telomere Pilot Study specimens tested for telomere length quantification

OCTOBER

OCT 8 Confirmatory Factor Analysis to derive WELL score for WELL U.S. and WELL China completed

OCT 12 Pilot Study for the WELL Thailand Survey launched

OCT 28 WELL COVID-19 supplemental survey on impact of US politics & wildfires on stress & well-being launched

OCT 30 WELL Global Online Study launched

OCT 30 WELL Facebook page reactivated to enhance engagement

NOVEMBER

NOV 18 Singapore WELL score analysis completed

NOV 30 WELL Thailand full-scale survey launched

2020 PUBLISHED RESEARCH

Well-being and Homelessness

Naina Ahuja, our former research assistant with a Master's degree in Public Health from Columbia University, worked with the WELL team and a community organization that provides transitional housing to compare the well-being of people who are homeless with that of a matched sample of housed WELL participants. While the average WELL score of the homeless participants was lower, they had several domains of unexpected strength, including a strong sense of self, purpose and meaning in life, and religiosity/spirituality.

Comparing WELL Diet Score and Alternative Healthy Eating Index

Dr. Sparkle Spring field, a former post-doctoral fellow at SPRC and now a faculty member at Loyola University in Chicago, compared the 12-question WELL Diet Score to the Alternative Healthy Eating Index-2010 (AHEI) that uses a 127-item survey. The WELL Diet Score generated similar results to the lengthier AHEI questionnaire, suggesting this shorter assessment can be used in future studies.

Taiwan's Perspective on Well-being

Dr. Patricia Espinosa, a former WELL post-doctoral fellow and now an instructor in the Department of Epidemiology and Population Health at Stanford, used qualitative interviews to investigate the key pillars of well-being at our WELL Taiwan study site, and to further our understanding of nuances in well-being across cultures. She found that familial relationships and financial security are key to well-being in Taiwan.

WELL China Cohort Profile

Yan Min, a WELL research assistant and PhD student in the Department of Epidemiology and Population Health, summarized operations and baseline results of WELL China—an ongoing prospective cohort led by Stanford University and Zhejiang University in China. The objective of this cohort (10,268 participants) is to measure individual well-being over time. It is an observational cohort with the possibility of future intervention studies as well as community engagement to influence well-being.

New Initiatives

2020 New Studies

WELL Global Study

We launched the WELL Global Study in October. It is an online survey in English open to anyone who has access to the internet. This will extend WELL's reach to include more people of different social, geographic, and cultural backgrounds. Please invite friends and family to join us. redcap.link/WELLGlobalStudy

WELL Thailand: A New Study Site

WELL collaborated with Chulalongkorn University in Bangkok to establish a study site in Bangkok. In phase 1, we focused on understanding how well-being is perceived in Bangkok. We used this knowledge to develop our well-being questionnaire and rolled out the study to 2,000 Bangkok residents in November. Recruitment of the WELL Thailand Study is expected to be completed in 2021. The WELL Thailand Study is led by *Dr. Cathy Heaney* at Stanford, a co-investigator of the Stanford WELL for Life Study and an associate professor in the Department of Psychology and of Medicine, and *Dr. Nipat Pichayayothin Bock*, a psychologist and an assistant professor at Chulalongkorn University in Bangkok. https://med.stanford.edu/wellforlife/initiatives1/wellthailand.html

A Pilot Study of Saliva Collection

We conducted a pilot study to assess whether it would be possible to collect biological specimens from U.S. participants. We received saliva samples from over 350 participants and are using them to examine the link between telomere length and well-being.

2021 Planned Pilot Studies

A Pilot Study of Wearable Technology

We are planning a pilot study where participants in China and the U.S. will wear a wristband for several months to capture real-time data on heart rate, body temperature, oxygen saturation, sleep, physical activity, and stress. We hope to gain insight into the link between well-being and biometric measurements and learn about the logistical issues related to wearable devices to inform the design of the full-scale study.

A Pilot Study on Gut Microbiome and Well-being

Data from previous studies suggest that stress, depression, and immunity are related to the gut microbiome. In conjunction with the wearable technology pilot, we are incorporating a gut microbiome component to examine the links between heart rate variability, stress, and well-being. We will be collecting stool samples from participants to link gut microbiome data to biometric data to enhance our understanding of the biological underpinnings of well-being.

WELL for Life Smart Phone App

To increase accessibility and participation in WELL studies, we plan to develop a smart-phone health app to allow users to track their well-being by linking to a wearable device we provide, access their personal well-being status through regular WELL surveys, get well-being management resources, progress reports, scientific updates, and a way to connect to well-being communities and support teams.

2020 Collaborations

Psychometrics and Confirmatory Factor Analysis

Dr. David Lounsbury, Associate Professor at Albert Einstein College of Medicine in the Department of Epidemiology & Population Health, is a clinical psychologist and expert in psychometrics and participatory system dynamics modeling (PSDM). As a collaborator with WELL, he helped us with confirmatory factor analysis to refine the measurement models and algorithms of our WELL score, a quantitative index of well-being.

Mobility and Well-being

We are collaborating with scientists from the Ford Motor Co Ltd. to study the relationship between mobility and well-being. The Ford Mobility Team, led by *Dr. Clay Maranville*, along with the WELL team developed a mobility survey. In 2021, we will conduct a pilot study to incorporate wearable technology to track real-time movement and its impact on well-being.

## Dietary Inflammation Index and Hypertension

Dr. Michael Wirth, Assistant Professor in the Department of Epidemiology and Biostatistics at the University of South Carolina, developed a dietary inflammation index (DII) for assessing the role of diet in relation to health outcomes. Dr. Wirth derived DII scores for participants in WELL China. Dr. Anthony Crimarco, a Stanford post-doctoral fellow, found that participants with a higher DII score, indicating greater inflammatory potential from diet, had an increased risk of hypertension.

A Pilot Study of Telomere Length and Well-being

We are collaborating with *Dr. Jue Lin* at the University of California at San Francisco (UCSF) to quantify telomere length in 600 DNA samples to 1) assess whether the saliva and buffy coat samples we collected are of good quality, 2) determine whether there is enough variation in telomere length in our study population, and 3) inform the statistical power needed for our full-scale study of telomere length and well-being.
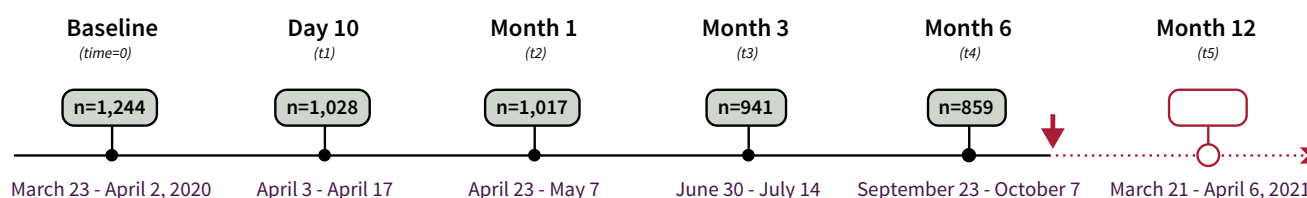
COVID-19 Studies
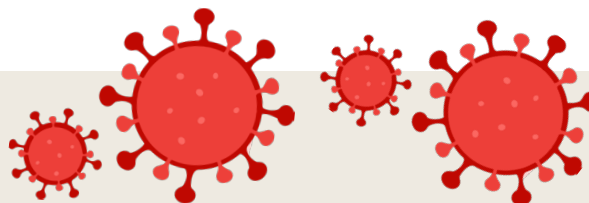
To investigate the effect of COVID-19 and the Shelter-in-Place orders on anxiety, distress, lifestyle factors, and well-being, WELL launched a longitudinal study to survey participants in the San Francisco Bay Area six times (see figure below) between March 2020 and March 2021. Analyses are underway and we have submitted several manuscripts. Below is a summary of some of the results.

COVID-19 WELL Bay Area Follow-Up Study

N=1,244

Baseline *(time=0)*	Day 10 *(t1)*	Month 1 *(t2)*	Month 3 *(t3)*	Month 6 *(t4)*	Month 12 *(t5)*
n=1,244	n=1,028	n=1,017	n=941	n=859	
March 23 - April 2, 2020	April 3 - April 17	April 23 - May 7	June 30 - July 14	September 23 - October 7	March 21 - April 6, 2021

Physical Activity During COVID-19

Dr. Erin Vogel, a post-doctoral fellow with the Stanford Prevention Research Center (SPRC), and her mentor, *Professor Jodi Prochaska*, found that people who reported managing their stress by engaging in physical activity or reading experienced less stress during the COVID-19 shelter-in-place orders. People who managed stress by watching more TV/movies, sleeping more, or eating had increased stress. Manuscript has been submitted.

Mask Wearing During COVID-19

We surveyed participants about their mask-wearing habits. Ninety percent of those who ate outside at a restaurant wore masks. Ninety-nine percent of participants who went grocery shopping wore a mask all or most of the time. Of the participants who went to a public park or beach, 55 percent wore masks all or most of the time.

Benefits of Contemplative Practice Behaviors

Dr. Benjamin Chrisinger, a former post-doctoral fellow at SPRC and now an assistant professor at the University of Oxford, England, and *Dr. Tia Rich*, the Director of th e Stanford Contemplation by Design Initiative, found that contemplative practice behavior (mindfulness and compassion) was associated with resilience, positive emotions, dealing with stress, and less depression. Manuscript has been submitted.

COVID-19 Vaccination

In the same survey, we learned that 48 percent of the participants said they would be willing to be vaccinated if there was a free, FDA-approved vaccine to protect against COVID-19. Thirty-five percent said they were not sure and 17 percent would not get the vaccine.

WELL COVID-19 Studies in China and Singapore

In addition to the US studies, WELL China completed a study on COVID-19 in April 2020 and WELL Singapore is planning to launch a COVID-19 study in January 2021.

China

About 3,300 participants from WELL China took part in a COVID-19 telephone survey in April 2020. There was an increase in depressive symptoms among all participants during the lockdown period in China.

Singapore

We are collaborating with the National University of Singapore on an online survey to understand well-being and psychosocial resilience in Singapore during the pandemic. Results from this study will inform appropriate government policies to improve well-being in Singapore.

Engaging our Community

During our COVID-19 study, our participants said they wanted a reliable source of information and resources to help them manage their stress and anxiety about the pandemic and social isolation. We were happy to step forward and provide this for our community.

WELL Virtual Town Hall Meeting

In April 2020, we held our first virtual Town Hall meeting through Zoom to provide support for our community during this stressful time. Three experts shared tips about how to manage stress related to COVID-19 with over 120 community members attending the virtual meeting.

WELL Newsletters

Between April and June, we increased the frequency of our newsletter from monthly to weekly, and included useful resources related to COVID-19, well-being, resilience, stress management, and preliminary results from our research. Participants also shared their stories with the community. If you are interested in receiving our newsletter, please email wellforlife@stanford.edu. You can find our past newsletters here: med.stanford.edu/wellforlife/well-resources/newsletters

WELL Participant Shares Expertise

One of our WELL participants, *Christy Johnson*, showed her appreciation for WELL by stepping up to offer her expertise to help us. Christy is the Founder and CEO of Artemis Connection, Inc. and a graduate of the Stanford Graduate School of Business. For two months, Christy's team worked pro bono to help WELL identify our unique strengths, weaknesses, needs, focus, and a strategy for WELL to thrive in the future.

Why I Joined WELL

Some of our participants shared with us why they joined WELL.

Stephanie
Los Angeles

"I found Stanford WELL by happenstance during an internet search. As a Stanford alum, I was blown away by this study, with its tremendous impact on global health and as a way to improve my own wellbeing. I took the initial survey a couple of years ago in late fall (pre-New Year's resolutions) and it was a wonderful benchmark of my strengths as well as opportunities to enrich my health, even more. Since then I have thoroughly enjoyed the newsletters, health surveys and challenges. I'm inspired by WELL's ongoing research efforts. Health is wealth. There is no better gift we can give to ourselves, our families and our communities than a holistic approach and commitment to living our best life."

Christopher
Palo Alto

"I joined WELL because I believe the Stanford team that runs WELL has accurate, objective, evidence-based advice that I can trust about diet, physical activity, sleep, and more. And I joined WELL for the opportunity to contribute to the science of well-being as a citizen scientist – I can be part of the process of finding the answers to important questions about wellness, for myself, my family and my community."

Cynthia
San Diego

"I wanted to be part of a group that was helping to provide information that could lead to a better understanding of living a healthy life and being as well as possible. I also like to give back to my community in various ways and joining research studies, like WELL, is one easy way to give back. Lastly, it is nice to belong to various groups, and joining WELL in some ways felt like belonging to a bit of a new community or group. I take pride in being part of this WELL group."

Cindy
Castro Valley

"I joined the Stanford WELL for Life initiative because I was inspired by Ann Hsing and the mission-driven goals around advancing our understanding of well-being. I continue to participate in the program in part because it feels like an opportunity for us to all come together to build a scientific understanding of wellness during trying times that have been undermining science seemingly constantly in 2020. I appreciate the time and thought put into the newsletter where aspects of our global emotional experience are discussed directly and with compassion. Stanford WELL feels inclusive and full of promise and opportunity."

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TO ALL OF OUR DONORS,
THANK YOU FOR YOUR GENEROUS SUPPORT

Foundational funding for the Stanford Wellness Living Laboratory (WELL) was provided by Amway via an unrestricted gift through the Nutrilite Health Institute Wellness Fund.

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Through the Stanford-Thailand Research Consortium, AP Thai provided support for WELL Thailand research.

The Mobility and Well-being Pilot Study was supported by Ford Motor Company.

Stanford Department of Medicine provided generous bridge funding for WELL in 2020 and 2021.

Individual Donors

Drs. Michael Cheng and Vicky Wang	*Mrs. Fei Fei Kawaguchi*	*Dr. Marion Lee*	*Mrs. Marjorie Wu*	*Mrs. Lillian Yau*
Dr. Harvey Hsiang and Mrs. Emily Hsiang	*Mr. Hikaru Kawaguchi*	*Ms. Helen Lee*	*Dr. Sam Rehnborg*	

INVEST in WELL-BEING

The accomplishments of the WELL for Life initiative have been made possible, in large part, by philanthropic support. Additional support will be essential for us to continue to improve health, wellness, and well-being around the world. All gifts to Stanford are tax deductible in the United States and can be made via makeagift.stanford.edu/get/ page/ makeagift or by calling 866.543.0243.

Please be sure to designate "WELL for Life". If you have questions regarding making a gift to WELL, please contact jill.stanley@ stanford.edu. We appreciate your consideration!

Donations are tax deductible to the full extent provided by law.

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