MHSA Innovation 3 Project – Increasing Access to Mental Health Services and Supports Utilizing a Suite of Technology-Based Mental Health Solutions

The Los Angeles County Department of Mental Health (LACDMH) proposes to engage in a multi-county Innovation project to work with one or more technology companies with experience with virtual mental health care platforms, including the capacity to implement technology-based mental health solutions accessed through multiform-factor devices (for example, a computer, smartphone, etc.) to identify and engage individuals, provide automated screening and assessments and improve access to mental health and supportive services focused on prevention, early intervention, family support, social connectedness and decreased use of psychiatric hospitals and emergency services.

The innovation proposed here is to test out and implement a group of technology-based mental health solutions, including the utilization of passive data collection as a method to identify the early signal biomarkers for mental health symptoms and offer prompt, timely intervention.

Goals and Relevance

The research is growing rapidly on the impact that technology is having on health and mental health outcomes, including decreasing hospital and emergency department utilization through real-time non-intrusive early detection of symptoms associated with the onset, recurrence or exacerbation of mental illness. The goals of this project include:

- Increase access to care needed and desired
- Reduce time to recognition and acknowledgement that a symptom needs to be addressed and reduce time to receiving appropriate level of care.
- Increase ability to analyze and collect data from a variety of sources to improve mental health needs assessment and delivery of services.
- Increase purpose, belonging and social connectedness for users
- Reduce stigma associated with “mental illness” by promoting mental optimization.
- Advance outcome measurement through passive data analysis and comparison of passive and active data sets.

This would be considered a 3 year demonstration project.

Innovation Primary Purpose

Overall, the primary purpose of this Innovation project is to increase access to mental health care and support and to promote early detection of mental health symptoms, or even predict the onset of mental illness.

This project will dismantle barriers to receiving mental health services by outreaching, engaging and treating individuals using approaches that build on increasingly familiar technology devices as a mode of connection and method of treatment to reach people who are likely to go either unserved or underserved by traditional mental health care. In the same way LA's first Innovation project featured a treatment model that utilized culturally relevant outreach and engagement strategies, this project will utilize applications on smart phones, tablets or computers as a tool engage, support and educate users. It will also serve to reduce the stigma associated with mental health treatment through the use of virtual innovative engagement strategies, care pathways and bidirectional feedback.

The Premise

- Digital therapeutic technology platforms such as applications or websites that utilize trained peers to deliver support and manualized interventions will serve as a valuable service portal for individuals with mental health concerns, family members needing support and possibly an entry portal into the public mental health system.
- Developing and implementing an application that individuals can download and voluntarily agree to use that utilizes passive information, in the way a FitBit does, to help an individual identify changes in behavior, feelings or thoughts and suggest a course of action (increasing behavioral activation, talk to a friend,etc.)
- Strategic use of passive data may help identify individuals at risk of developing Schizophrenia or other mental health disorders and could play a role in reducing the functional impact of mental disorders.

Target Population

The target population or intended beneficiaries or users of technology-based mental health solutions:

- Individuals with sub-clinical mental health symptom presentations, including those early in the course of a mental health condition who may not recognize that they are experiencing symptoms, including college students.
- Individuals identified as at risk for developing mental health symptoms or who are at risk for relapsing back into mental illness
- Socially isolated individuals, including older adults at risk of depression
- High utilizers of inpatient psychiatric facilities
- Existing mental health clients seeking additional sources of support
- Family members with either children or adults suffering from mental illness who are seeking support.
- Individuals at increased risk or in the early stages of a psychotic disorder.

Technology-Based Mental Health Solutions

The components of this Innovation project are as follows:

1. **Utilize technology-based mental health solutions designed to engage, educate, assess and intervene with individuals experiencing symptoms of mental illness, including:**
    1.1. Virtual Peer chatting through trained and certified peers with lived experience.
    1.2. Virtual communities of support for specific populations, such as family members of children or adults with mental illness, those experiencing depression, trauma and other populations.
    1.3. Virtual chat options for parents with children engaged in the mental health system.
    1.4. Virtual chat options for parents of adults with mental illness
    1.5. Virtual manualized interventions, such as mindfulness exercises, cognitive behavioral or dialectical behavior interventions delivered in a simple, intuitive fashion.
    1.6. All chat and manualized interventions will be available in all threshold languages.
    1.7. Referral process for customers requiring face-to-face mental health services by LAC DMH.

2. **Utilize passive sensory data to engage, educate and suggest behavioral activation strategies to users, including:**
    2.1. Incorporate passive data, defined collected patterns of use without any required participation from the user (devoid of content), from mobile devices into an interactive approach to digital phenotyping, defined as the using device usage patterns to identify behavior patterns that may be associated with mental health conditions, where the technology analyzes factors associated with cell phone usage (passive data) and interacts with the user via pop-up or chat functionality that allows for the increased user understanding of thought, feeling and behavioral states that could lead to earlier detection and treatment options.
    2.2. Understanding targeted communications and interventions that are most effective for each patient by measuring intervention engagement and response using digital biomarkers created from passive mobile device data.
    2.3. Incorporate emerging digital phenotyping research in the field of mental health early detection to target individuals at risk of or experiencing early symptoms of mental illness and use passive data collection to identify risk/symptoms or potential for relapse.

3. **Create a strategic approach to access points that will expose individuals to the technology-based mental health solutions described above, including:**
    - 3.1. Engaging school systems, including higher education, to promote use of these applications.
    - 3.2. Engaging users through social media, the DMH website and other digital platforms and approaches.
    - 3.3. Engaging mental health organizations such as the National Alliance for Mental Illness (NAMI) groups to promote use of applications.
    - 3.4. Engaging senior centers and other key locations where senior adults are likely to congregate to promote use of applications.
    - 3.5. Engage public locations such as libraries or parks in setting up kiosks or in encouraging use of applications
    - 3.6. Engage psychiatric emergency and inpatient settings, including Mental Health Urgent Care Centers, in identifying individuals at high risk of relapse from mental illness to encourage use of applications.

4. **Develop method and conduct outcome evaluation of all elements of the project, including measuring reach and clinical outcomes.**
    - 4.1. Increased well-being of users.
    - 4.2. Reduced duration of untreated or under-treated mental illness.
    - 4.3. Increased ability for users to identify cognitive, emotional and behavioral changes and act to address them.
    - 4.4. Increases in quality of life, as measured objectively and subjectively (by user and by indicators such as activity level, employment, school involvement, etc.).
    - 4.5. Identify a method and implement the measurement of the duration of untreated mental illness associated with use of strategies 1, 2 and 3.

Qualifications for Innovation Project

"Innovative Project": This is a project that the county designs and implements for a defined time period, and evaluates to develop new best practices in mental health. An Innovative Project meets one of the following criteria:	**Select One**
1. Introduces a new approach or approach that is new to the overall mental health system, including, but not limited to, prevention and early intervention.	X
2. Makes a change to an existing practice in the field of mental health, including but not limited to, application to a different population	
3. Introduces a new application to the mental health system of a promising practice or approach that has been successful in a non-mental health context	

The challenge to be addressed by this Innovation Project and Why it is a County Priority:

This project seeks to test out novel approaches to mental illness preemption and prevention, early relapse detection, outreach and engagement as well as the delivery of manualized therapeutic interventions and supportive services through technology-based mental health solutions, delivered by trained peers.

One of the primary objectives of the Mental Health Services Act is to identify and engage individuals with mental illness who are either un-served or under-served by the mental health system. The Los Angeles County Department of Mental Health, through the Mental Health Services Act, has funded outreach and engagement staff, Service Area Navigators, Promotores to outreach and engage individuals with mental health needs into mental health care. While these approaches have been effective, in order to make a greater impact in reducing the duration of untreated mental illness and disparities in mental health treatment, early detection, outreach and engagement strategies must evolve. This project seeks to test out the use of a set of technology tools to identify individuals who may need mental health care and to reach these individuals for whom we have not been successful in identifying or engaging through methods that have become increasingly relevant to specific populations.

This project also will also expand the Department's use of peer support, creating new roles for peers in the delivery of engagement and service delivery through a virtual platform that has never been utilized by the Department before.

Overarching Learning Questions

1. Will individuals either at risk of or who are experiencing symptoms of mental illness use virtual peer chatting accessed through a website or through a phone application?
2. Will individuals who have accessed virtual peer chatting services be compelled to engage in manualized virtual therapeutic interventions?
3. Will the use of virtual peer chatting and peer-based interventions result in users reporting greater social connectedness, reduced symptoms and increases in well-being?
4. What virtual strategies contribute most significantly to increasing an individual's capability and willingness to seek support?
5. Can passive data from mobile devices accurately detect changes in mental status and effectively prompt behavioral change in users?
6. How can digital data inform the need for mental health intervention and coordination of care?
7. What are effective strategies to reduce time from detection of a mental health problem to linkage to treatment?
8. Can we learn the most effective engagement and treatment strategies for patients from passive mobile device data to improve outcomes and reduce readmissions?

9. Can mental health clinics effectively use early indicators of mental illness risk or of relapse to enhance clinical assessment and treatment?
10. Is early intervention effective in reducing relapse, reducing resource utilization and improving outcomes and does it vary by demographic, ethnographic, condition, intervention strategy and delays in receiving intervention?
11. Can online social engagement effectively mitigate the severity of mental health symptoms?
12. What are the most effective strategies or approaches in promoting the use of virtual care and support applications and for which populations?

Stakeholder involvement in proposed Innovation Project

LACDMH's stakeholder process meets Welfare and Institutions Code 5848 on composition of the System Leadership Team (SLT) and meaningful involvement of stakeholders related to mental health planning, policy, implementation, monitoring, quality improvement, evaluation and budget allocations. The composition of the System Leadership Team meets California Code of Regulations Section 3300 on stakeholder diversity.

To create meaningful stakeholder involvement, LACDMH engages 3 levels of stakeholder involvement in ongoing mental health service delivery planning: The SLT, SLT Ad Hoc and Standing Committees that inform recommendations made to the SLT and each of the 8 Service Area Advisory Committees (SAACs).

The 58 member SLT is composed of individuals representing the following organizations, cultures and interests:

- *LA County Chief Executive Office*
- *Representation from each Service Area Advisory Committee*
- *Consumer and family member representation, including NAMI, self-help and the LA County Client Coalition*
- *Department of Public Social Services*
- *Health Care, including the Hospital Association and LA County Department of Public Health, LA County Department of Health Services*
- *LA Police Department*
- *Probation*
- *Housing development*
- *Older Adult service providers and LA County Community and Senior Services*
- *Under-Represented Ethnic Populations, including Asian Pacific Islanders, American Indian, African American, Latino and Middle Eastern/Eastern European perspectives*
- *Clergy*
- *City of Long Beach*
- *Veterans*
- *LA County Mental Health Commission*
- *Unions*
- *Co-Occurring Joint Action Council*

- *Education, including the LA Unified School District, universities and charter schools*
- *Lesbian, Bisexual, Gay, Transgender and Questioning (LBGTQ)*
- *LA Department of Children and Family Services*
- *LA County Commission on Children and Families*
- *Junior blind*
- *Statewide perspective*
- *Mental health providers, including the Association of Community Human Service Agencies (ACHSA)*

Planning for this project began after a meeting convened by the Mental Health Services Oversight and Accountability Commission at Google-Verily headquarters in South San Francisco on technology – mental health partnerships. A proposal was presented to the System Leadership Team on June 21, 2017 with a request for feedback. The plan was publically posted on the Department's website on July 21, 2017 and remains posted. In addition, an overview of the proposal was presented to the County's Mental Health Commission on June 22, 2017. Feedback received from all proposal vettings was overwhelmingly positive. Stakeholders expressed an interest in utilizing technology in the public mental health sector. Feedback beyond that has been categorized in the following manner:

- Populations of interest:
    - Request to include older adults, particularly those who are socially isolated.
    - Individuals who are socially isolated or who have geographic barriers to accessing care.
    - Specific cultural groups will be particularly engaged with technology, while others may not.
    - Ensure language capacity
    - Concern related to the quality of connectedness (face to face vs. virtual)
    - Concerns regarding increasing paranoia of users or the unintended consequences of the passive use of data to users (concerns about "big brother").
- Availability of computers, tablets, smart phones
- Ensuring selected vendor outreaches and promotes use of the product to underserved communities and in a culturally competent manner.
- Ensure that vendor can identify users who require more care and assist them in getting mental health care.
- Consider how mental health clinics can promote and/or use the elements of the technology suite with their clients to enhance clinical assessment and treatment effectiveness.

Feedback has been considered and much of it incorporated into the proposal or will be incorporated into the implementation phase of this project.

Board of Supervisor Proposal Support

Jonathan E. Sherin, M.D., Ph.D., Director of the Los Angeles County Department of Mental Health, has briefed each Board of Supervisor and has received an endorsement to move forward with this proposal.

Timeframe of the Project and Project Milestones

The projected timeframe is as follows but, due to the innovative nature of this project, actual implementation steps may deviate in terms of sequence and/or timeframes:

July 21, 2017	30 Day Public Posting of Proposed Project.
August 24, 2017	Conceptual presentation to the MHSOAC
October 26, 2017	Presentation of full proposal to the MHSOAC
October – December 2017	Review and selection of technology company(s)
December, 2017	Selection and awarding of contract
January, 2018	Creation of a technology suite steering committee comprised of family members, clients (including a transition age youth client), Department Information Technology staff and other stakeholders that provide feedback on implementation and guide use and scaling of project, as well as shaping the evaluation. This committee will also make recommendations on the use of the technology suite in clinical settings and the role of the services within the county's mental health system of care.
February, 2018	Launch of virtual services on the Department's website.
March – April 2018	Identify analytics to be collected and reported on, including developing reporting framework.
March 2018 – June 2018	Launch of virtual services through identified strategic access points, including schools, libraries, NAMI, client run organizations, social media, senior centers, etc. focused on tablet, smart phone or desktop/laptop computer.
March,2018–August,2018	Development, testing and implementation of digital phenotyping (deliverable #2) and introduction of technology-based mental health solutions to users via schools, social media, and other key community organizations.

FY 2018-2019 Development, testing and implementation of deliverable 2.2, including identifying key access points.

FY 2019-20 - FY 2020 – 21 Continued use, evaluation and scaling and a final evaluation to the Department.

Proposed Implementation and Dissemination Strategies

The Los Angeles County Department of Mental Health utilized a technology consulting firm with experience working with the County of Los Angeles to do an analysis of technology companies who have experience with the technology suite components. A list was developed that will serve as a guide to the selection of vendor(s). In addition, the LACDMH Deputy Director in charge of program development, early in the stages of the development of this project, convened a call with the Department's Privacy Officer, Compliance Officer, Chief Information Technology manager and her staff and County Counsel to outline privacy, security and any legal concerns as LACDMH moved forward in the development of the proposal. These requirements and safeguards were inserted into a draft Statement of Work developed by LACDMH.

As interested counties identify the elements of the technology suite they wish to employ and obtain approval from the Mental Health Services Oversight and Accountability Commission, each county's funding will be sent to CalMHSA, the county behavioral health Joint Powers Authority that was created for multi-county partnerships. Each county will utilize one or more elements of the technology suite, customized to each county's needs. Los Angeles County has drafted a Statement of Work to be utilized in the selection of the vendor(s). CalMHSA will then enter into a contract with selected technology vendor(s) and the multi-county collaborative will collectively direct the work through regular meetings.

The technology vendor(s) would identify a Project Manager for the multi-county collaborative as well as one specifically for Los Angeles County. The LA County Project Manager would work with lead LACDMH staff to identify and sequence the dissemination/roll-out of the applications, including:

- Establishing a link to a peer and family chatting website (component #1) on the LACDMH website.
- Utilizing social, print and possibly outdoor media to promote the website/applications.
- Building on existing work with the LA County Library system, outreach to libraries for use.
- Partner with universities and colleges.
- Engage Transition Age Youth Drop In Centers to utilize the website and applications.
- Engage hospital discharge and case management staff on the use of the applications.
- Promote use of applications at the LACDMH Peer Resource Center and in Wellness and Client Run Centers throughout the county.

- Utilize peer specialist staff to teach clients how to use the application(s) in waiting rooms.
- Engage NAMI, senior centers and older adult service centers on the use of the peer and family chatting application as an added source of support.
- Introduce the technology suite to mental health clinicians as an additional tool to guide interventions.

As the technology suite is implemented, referral protocols will be put into place, through the LACDMH Access line, for clients who request or need mental health services.

As with all components of the MHSA, implementation and preliminary outcomes will be reviewed with the LACDMH's SLT periodically and will be reported on in MHSA Annual Updates/MHSA Three Year Program and Expenditure Plans.

Within Los Angeles County a steering committee would be formed consisting of interested stakeholders and key LACDMH staff that would review progress, available data and inform implementation. As new target populations are identified or as data suggests which populations seem to use and benefit from each application, mid-course implementation shifts will be made accordingly.

A cross-county steering committee will be formed by the participating counties for purposes of guiding the project, reviewing data and analytics, ensuring appropriate privacy and security remains in place and, equally as important, to learn and improve.

LACDMH will actively participate in Mental Health Services Oversight and Accountability Commission sponsored Innovation Summits and resulting forums for cross-county learning and support related to the use of technology in the mental health system.

Overall Approach to Evaluation

This project will be evaluated by tracking and analyzing passive data, reach of users, level of user engagement, changes in access to care and clinical outcomes. Furthermore, data from mobile devices would be analyzed to detect changes in mental status and responses to online peer support, digital therapeutics and virtual care. Continuous assessment and feedback would drive the interventions. Specific outcomes include:

1. Increased purpose, belonging and social connectedness for users.
2. Increased ability for users to identify cognitive, emotional and behavioral changes and act to address them.
3. Increases in quality of life, as measured objectively and subjectively (by user and by indicators such as activity level, employment, school involvement, etc.).
4. For high utilizers of inpatient or emergency services, decreases in utilization for those services.
5. Reduced stigma of mental illness as reported by user.
6. Comparative analyses of population level utilization data in Los Angeles County over the life of the project to determine impact on various types of service utilization.

7. For clients with particular sorts of biomarkers (characteristics identified either through history or digital phenotyping analysis), how many clients respond well to treatment options identified through this project?
8. What is the role of this technology as a source of information that can help guide the interventions provided by mental health clinicians?
9. Examine penetration or other unmet need metrics to understand how the technology suite has impacted LACDMH's ability to serve those in need.

User outcomes will be measured by analyzing retrospective and prospective utilization of hospital resources from claims data and medical records data. The analysis will incorporate disease risk stratification, digital phenotype and digital biomarker measurement, type of intervention and delay in receiving care. Quality of life impact will include school grades, graduation rates, job retention, absenteeism and presenteeism.

Disseminating Successful Learning

The Department, as part of a multi-county effort, will share learning as it is occurring internally within the Department and County and externally throughout California. Within the Department/County LACDMH will provide regular reports to Service Area Advisory Committees (SAACs), the System Leadership Team or through other broader countywide opportunities. The Department will also participate in cross-county learning opportunities supported by the Mental Health Services Oversight and Accountability Commission or its partner organizations.

Impact, reach, implementation status and outcomes will be documented in Annual Updates and MHSA 3 Year Program and Expenditure Plans. In addition, LACDMH will seek to present the project and its outcomes throughout the project at statewide conferences, meetings and perhaps at relevant national conferences. LACDMH will also seek to partner with other counties who may be engaging in similar work, through venues such as the County Behavioral Health Directors' Association (CBHDA). Finally, there may be opportunity to partner on articles submitted to peer-reviewed journals.

Sustainability

Analytics associated with the suite of technology services, coupled with a comprehensive evaluation, will inform actions taken by the Department at the conclusion of the third year of the project. Factors to be taken into account will include user satisfaction and outcomes, the state of technology at the conclusion of the project and the overall effectiveness of these tools for specific populations.

Budget

$33 million over 3 Fiscal Years, starting mid-year in FY 2017-18. The breakout by fiscal year and component of the project is below. All funds will be MHSA Innovation funds. Given the highly innovative nature of this project, the budget breakout below is an estimate with the proportion of funds by element subject to change.

Direct costs include the development, refinement or modification of any technology-based mental health platforms and virtual care technology. The county will explore existing and immerging virtual care providers to contract with. The majority of the budget is for indirect costs including but not limited to salaries, marketing campaigns, community outreach and engagement overall project maintenance. The virtual care technology and engagement strategies to increase access for this project will require continuous tuning and refinement based on quantitative and qualitative data, analytics, user engagement.

Technology developers will be employed to build, modify and refine the forward facing technology platform/application and ensure all web interfaces are culturally relevant and integrate accessibility features for ESL and disabled populations. Database administers will be responsible for overseeing data storage and maintaining any servers needed. Data Scientists and engineers will run reports for analysis for regional stakeholders as well as provide necessary data analysis for passive data collection to enhance early detection of mental health issues. Machine Learning engineers will develop and User Experience, Quality Assurance, Clinical Operations will provide continuous tuning and refinement based on quantitative and qualitative data, analytics, user engagement.

Family Support Specialists will oversee and implement training and development of online family support networks for caregivers and families, School Support Specialists will develop and foster partnerships in educational settings to increase utilization of technology-based mental health solutions. Community and Outreach Coordinators will function to enhance relationships with community organizations, contracted providers and LACDMH directly operated clinics to assist with bridging offline and online services. Community and Outreach Coordinators will also provide specially curated outreach to specific target populations to channel users to the appropriate treatment path.

Public Relations and Marketing staff will serve to raise awareness about the virtual care services to boost engagement and utilization. Human Resources, Legal, Accountant, Office Assistant, Procurement will offer administrative responsibilities to support the project.

A Regional Director will serve to manage the entire County or region. The following leadership roles will serve to guide and oversee implementation of the project: Assistant Director, Director of Research, Director of Outreach, Clinical Director, Director of Community, Objectives and Key Results Coordinator.

The county will establish an evaluation steering committee which will help guide the evaluation process. The learning questions listed above will form the basis of the evaluation.

Estimated Budget by Fiscal Year						
Staffing						
Administrative		**FY 17-18 (partial year)**	**FY 18-19**	**FY 19-20**	**FY 20-21 (partial year)**	**Total**
	Public Relations and Marketing, Office Assistant, Procurement (CalMHSA)	$900,000	$1,500,000	$1,500,000	$450,000	$4,350,000
Leadership		**FY 17-18**	**FY 18-19**	**FY 19-20**	**FY 20-21**	**Total**
	Regional Director (LA), Management functions	$450,000	$900,000	$900,000	$450,000	$2,700,000
Direct Service (peer/family chatting)		**FY 17-18**	**FY 18-19**	**FY 19-20**	**FY 20-21**	**Total**
	Hospital Liaisons, Peer Specialists, Family Support Specialists, Trainers, Behavioral Health Coordinators, College Liaisons	$1,100,000	$2,200,000	$2,200,000	$1,100,000	$6,600,000
Technology Development						
Technology and Digital Phenotyping		**FY 17-18**	**FY 18-19**	**FY 19-20**	**FY 20-21**	**Total**
	Developers, Data Scientists, Machine Learning, User Experience, Quality Assurance, Clinical Operations, Product Management, Healthcare Solution Architect	$1,291,666	$2,583,000	$2,583,000	$1,292,334	$7,750,000
Community Engagement and Outreach						
Community Engagement and Development		**FY 17-18**	**FY 18-19**	**FY 19-20**	**FY 20-21**	**Total**
	Family Support, School Support, Community Coordinators, Outreach Coordinators, Advertising	$1,100,000	$2,200,000	$2,200,000	$800,000	$6,300,000
Evaluation						
Evaluation		**FY 17-18**	**FY 18-19**	**FY 19-20**	**FY 20-21**	**Total**
	Researchers and Healthcare Economists, Data Scientists and Statisticians, Health Policy Experts	$300,000	$600,000	$600,000	$400,000	$1,900,000
Operational and Fixed Costs						
Operational and Fixed Costs		**FY 17-18**	**FY 18-19**	**FY 19-20**	**FY 20-21**	**Total**
	Supplies for Users, Office Space and Furnishings, Machine and Technology Infrastructure, computer kiosks	$600,000	$1,100,000	$1,100,000	$600,000	$3,400,000
BUDGET TOTALS						
TOTAL INNOVATION BUDGET						**$33,000,000**