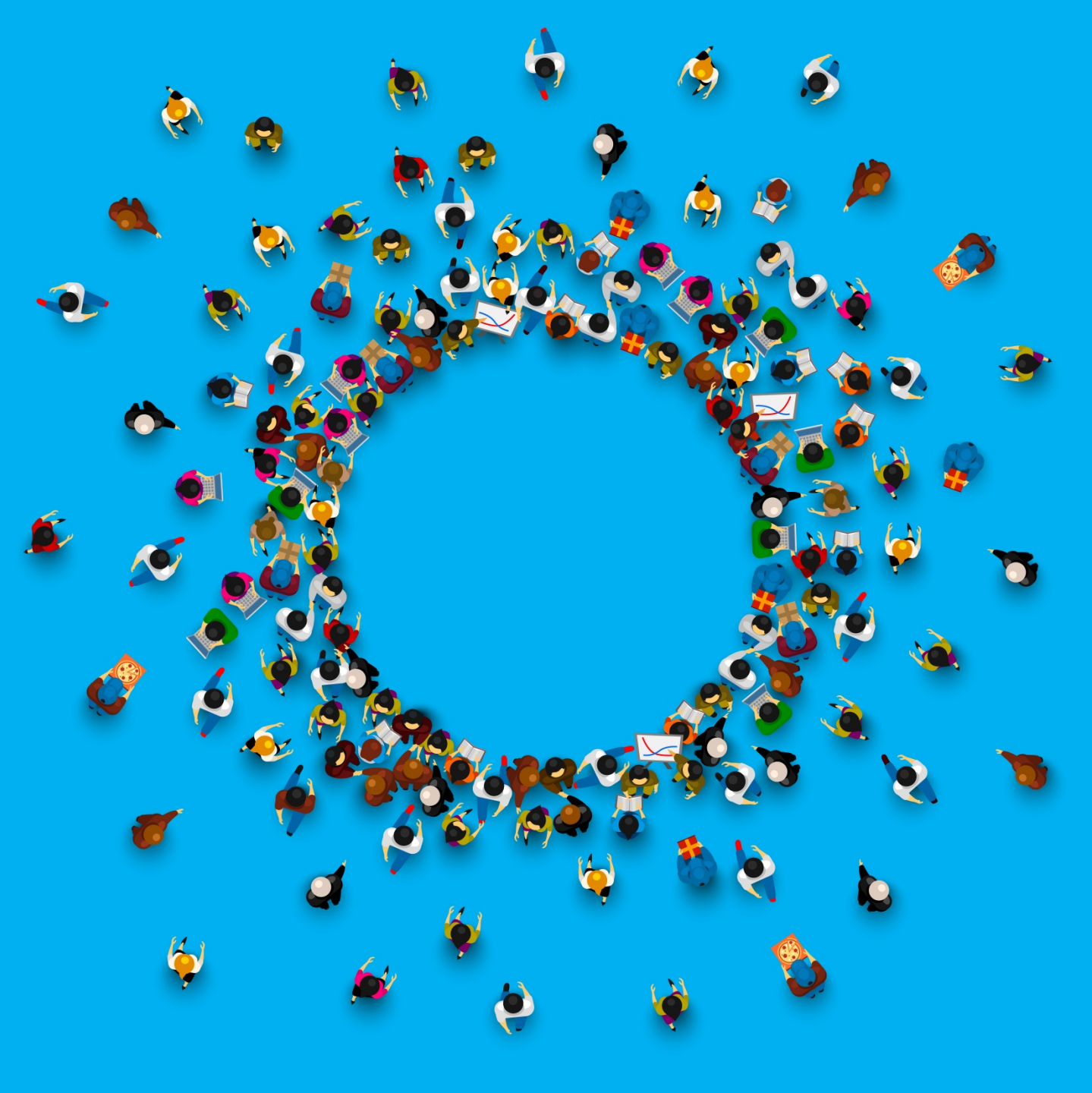# HEALTH CAPSULE

RESEARCH AND DESIGN GOALS

Access to quality Healthcare remains to be a challenge, but access to Mental Health is even more difficult considering the sensitive nature of illness and shortage of providers.

- **Need and Demand**
    As part of this research, we looked into the current state in mental health treatment, statistical data of patient-provider ratio to identify vulnerabilities in the current model of providing services.
- **Problems and solutions**
    What are the recommendations from Professional Organizations, Governing Bodies and Regulatory Agencies?
- **Innovations in treatment methodology**
    Technological innovations have infiltrated healthcare on every level. How are physicians and scientists using new tools in treatment? Is this another revolution in mental health treatment? How it influences the built environment and are we architects and designers in sync with science and medicine?
- **New Model of care**
    Do we need to develop a new model of care? How should we address Recommendations from Professional Organizations? Look into possible solutions and integration of new tools into the built environment around us, what is the original form of a clinic, is it still a physical space? Moreover, where we need them?
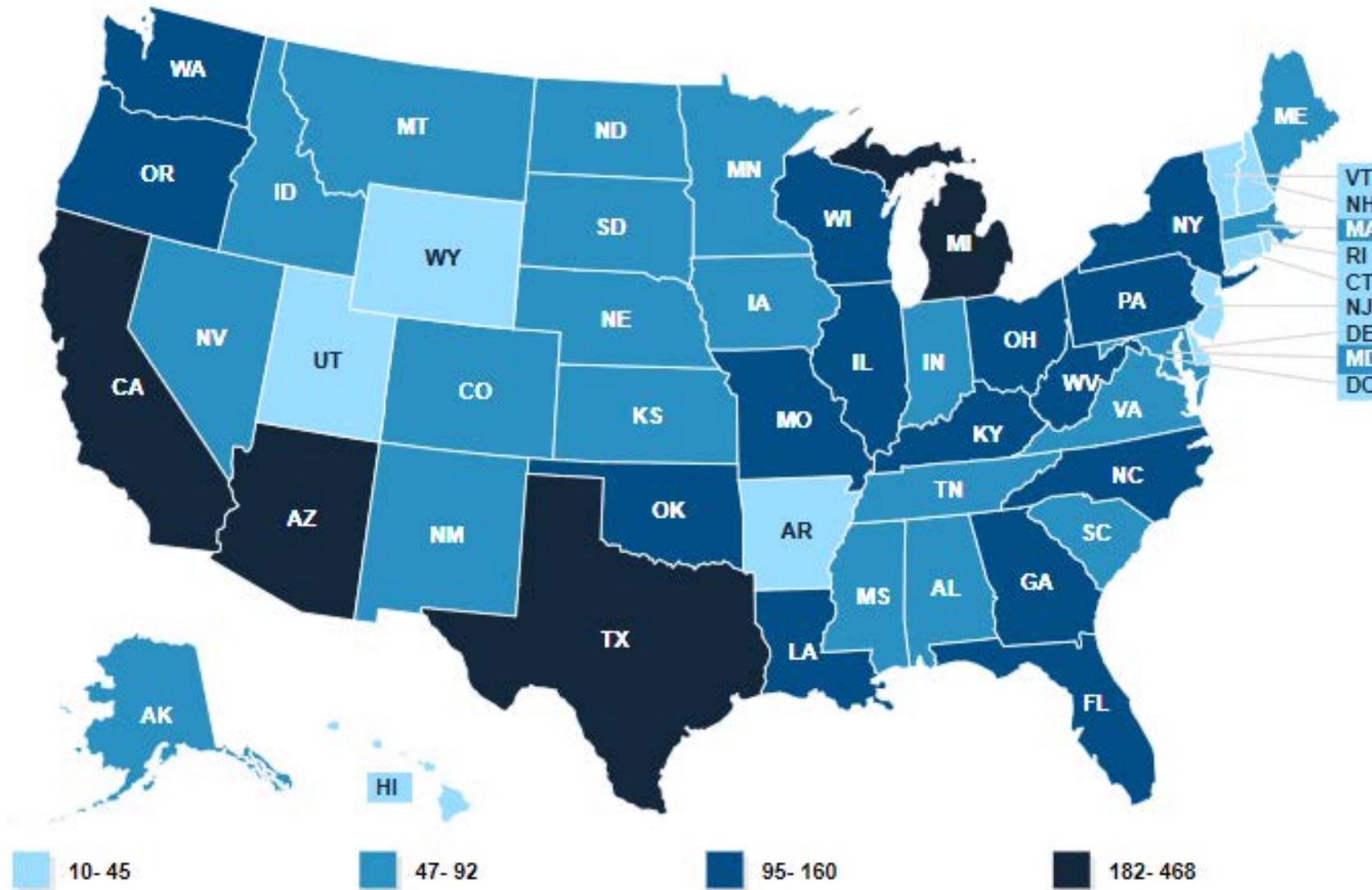- **Health Capsule**
    How new model could integrate into the current world and what the future may be.

NEED AND DEMAND

Concentration of providers vs. concentration of patients and how to balance it?

MENTAL HEALTH CARE HEALTH PROFESSIONAL SHORTAGE AREAS (HPSAS)

PROVIDER DESIGNATIONS

Source

Bureau of Health Workforce, Health Resources and Services Administration (HRSA), U.S. Department of Health & Human Services, Designated Health Professional Shortage Areas Statistics: Designated HPSA Quarterly Summary, as of December 31, 2017.

10- 45	47- 92	95- 160	182- 468

CURRENT STATISTICS PATIENT/PROVIDER RATIO NATIONWIDE

Location	Total Mental Health Care HPSA Designations	Population of Designated HPSAs	Percent of Need Met	Practitioners Needed to Remove HPSA Designation
United States [1]	5,042	123,832,882	32.52%	5,906

Notes

Health Professional Shortage Area (HPSA) designations are used to identify areas and population groups within the United States that are experiencing a shortage of health professionals. The primary factor used to determine a HPSA designation is the number of health professionals relative to the population with consideration of high need. Federal regulations stipulate that, in order to be considered as having a shortage of providers, an area must have a population-to-provider ratio of a certain threshold. For mental health, the population to provider ratio must be at least 30,000 to 1 (20,000 to 1 if there are unusually high needs in the community).

The number of mental health care HPSA designations includes HPSAs that are proposed for withdrawal and HPSAs that have no data. By statute, designations are not withdrawn until a Federal Register Notice is published, generally once a year on or around July 1.

Definitions

Percent of Need Met is computed by dividing the number of psychiatrists available to serve the population of the area, group, or facility by the number of psychiatrists that would be necessary to eliminate the mental health HPSA (based on a ratio of 30,000 to 1 (20,000 to 1 where high needs are indicated)).

Practitioners Needed to Remove HPSA Designation is the number of additional psychiatrists needed to achieve a population-to-psychiatrist ratio of 30,000 to 1 (20,000 to 1 where high needs are indicated) in all designated mental health HPSAs, resulting in their removal from designation. While mental health HPSA designations can include core mental health providers in addition to psychiatrists, most mental health HPSA designations are currently based on the psychiatrists only to population ratio. HPSA designations based on psychiatrists only do not take into account the availability of additional mental health services provided by other mental health providers in the area, such as clinical psychologists, clinical social workers, psychiatric nurse specialists, and marriage and family therapists.

Patient /provider ratio per state

Location	Total Mental Health Care HPSA Designations	Population of Designated HPSAs	Percent of Need Met	Practitioners Needed to Remove HPSA Designation
1. Northern Mariana Islands	2	69,221	86.96%	0
2. Hawaii	29	317,911	75.23%	5
3. New Jersey	38	32,755	71.51%	4
4. Rhode Island	13	442,172	67.86%	10
5. U.S. Virgin Islands	5	104,501	60.95%	9
6. Guam	2	159,358	58.97%	3
7. Maryland	59	1,535,876	52.52%	92
8. South Carolina	66	1,890,058	51.71%	61
9. Nebraska	84	1,038,994	50.82%	26
10. Iowa	72	1,694,382	48.07%	45
11. Utah	39	2,012,634	47.62%	57
12. New Hampshire	20	92,634	45.04%	3
13. Georgia	109	6,540,716	44.74%	205
14. Texas	425	9,628,656	44.02%	432
15. Nevada	65	3,867,098	43.69%	156
16. Kansas	71	1,444,937	43.65%	39
17. New York	159	4,435,492	42.43%	197
18. Massachusetts	56	436,302	42.35%	29
19. Arkansas	45	1,088,383	41.16%	31
20. Virginia	80	2,141,634	40.70%	110
21. Connecticut	34	3,212,364	40.52%	116
22. Pennsylvania	123	1,808,176	38.73%	105
23. West Virginia	129	1,444,996	37.56%	93
24. Kentucky	107	2,255,845	37.39%	87
25. Idaho	63	1,700,834	37.36%	45
26. Minnesota	65	1,996,166	37.19%	66
27. North Dakota	56	394,208	36.22%	20
28. California	468	6,486,018	33.99%	260
29. Maine	51	261,782	33.58%	29
30. Oregon	95	1,899,357	32.68%	84
United States [1]	5,042	123,832,882	32.52%	5,906
31. Ohio	113	2,334,584	31.00%	110
32. Indiana	81	4,604,867	31.70%	226
33. Wyoming	24	561,187	31.46%	25
34. Florida	160	4,935,227	28.88%	158
35. Michigan	269	3,796,494	28.74%	167
36. Colorado	92	2,084,535	28.25%	91
37. Illinois	126	5,128,380	28.02%	214
38. Alabama	53	2,913,725	25.83%	149
39. Mississippi	47	2,388,011	23.76%	372
40. Wisconsin	136	2,297,755	23.45%	247
41. Alaska	70	276,449	23.38%	10
42. Montana	82	558,619	23.20%	68
43. Louisiana	121	3,188,241	21.60%	165
44. Oklahoma	117	1,551,366	21.60%	93
45. Washington	158	4,438,434	21.09%	192
46. Puerto Rico	42	1,451,959	21.04%	51
47. Missouri	117	3,212,943	20.75%	159
48. North Carolina	152	2,679,240	19.81%	118
49. Arizona	182	9,164,190	16.56%	398
50. Tennessee	73	3,510,185	13.41%	308
51. South Dakota	64	665,269	12.69%	38
52. New Mexico	72	1,251,275	12.30%	75
53. Delaware	14	88,323	7.77%	15
54. District of Columbia	10	133,945	5.31%	28
55. American Samoa	2	57,292	0.00%	3
55. Federated States of Micronesia	8	107,020	0.00%	6
55. Republic of Palau	2	19,907	0.00%	1

CURRENT STATISTICS PATIENT/PROVIDER RATIO NATIONWIDE

CONSEQUENCES OF THE SHORTAGE

too little access to treatment for opioid use disorder, high burnout rates among VA psychiatrists, long waits for inpatient beds, and more.

statistics connected with the crisis:

- **Americans with a mental health condition: Nearly 1 in 5**

- **The number of psychiatrists in more than half of U.S. counties: 0**

- **People living in mental health professional shortage areas: 111 million**

- **Primary care physicians who reported difficulty referring patients for mental health care: 2 out of 3**

- **Increase in patients going to emergency departments for psychiatric services over a recent 3-year period: 42%**

CURRENT STATISTICS PATIENT/PROVIDER RATIO NATIONWIDE

REPORTS AND RECOMMENDATIONS

Health Organization, Governing Agencies and Professional Organizations predict increase in shortage unless current Healthcare Model implements new solutions and recommendations

Key Findings

Scenario One (baseline)

- By 2025,shortages are projected for: psychiatrists; clinical, counseling, and school psychologists; mental health and substance abuse social workers; school counselors; and marriage and family therapists.
- **Mental health and substance abuse social workers and school counselors will have shortage of more 10,000 FTEs.**
- Those projections are made relative to 2013 and reflect and assumption of approximate equivalence between baseline supply and demand for all practitioners except psychiatrists.

Scenario Two (alternative)

- There are estimated shortages for all nine types of behavioral health practitioners in 2013.
- **Six provider types have estimated shortages of more than 10,000 FTEs** (psychiatrists; clinical, counseling, and school psychologists; substance abuse and behavioral disorder counselors; mental health and substance abuse social workers; mental health counselors; school counselors).
- By 2025, shortages are projected for all but two provider types- behavioral health NPs and Pas. Those shortages are projected to be greater than 10,000 FTEs.
- These projections are also made relative to 2013, but, unlike the baseline scenario, they incorporate a 20 percent unmet demand for all behavioral health professions in 2013

PROJECTIONS

National Projections of Supply and Demand for Selected Behavioral Health Practitioners: 2013 - 2025

November 2016

U.S. Department of Health and Human Services
Health Recourses and Service Administration
Bureau of Health Workforce
National Center for Health Workforce Analysis

https://bhw.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/behavioral-health2013-2025.pdf

CONCLUSION

This report is one in a series of HRSA reports on the nation's health care workforce. These reports are intended to help provide an understanding of the current and future workforce supply in the context of a growing and aging population together with evolving models of care.

National demand for the nine categories of behavioral health providers modeled in this report is projected to grow due, in large measure, to the aging and growth of the U.S. population.

Under an assumption of approximate baseline equivalence between supply and demand (Scenario One), **projections indicate 2025 shortages of 16,940 mental health and substance abuse social workers; 13,740 school counselors; 8,220 clinical, counseling, and school psychologists; 6,080 psychiatrists; and 2,440 marriage and family therapists.**

Even greater shortages are projected under an assumption of 20 percent unmet demand at baseline (Scenario Two), with seven of the nine professions having 2025 shortages of more than 10,000 FTEs.

PROJECTIONS

National Supply and Demand, Scenario One (Baseline) and Scenario 2 (Alternative), All Behavioral Health Practitioner Categories, 2013 and 2015

Practitioner	2025 Projections Supply	2025 Projections Scenario One (Baseline)		2025 Projections Scenario Two (Alternative)	
		Demand	Difference[a]	Demand	Difference[a]
Psychiatrists	45,210	51,290	-6,080	60,610	-15,400
Behavioral Health Nurse Practitioners	12,960	8,120	4,840	10,160	2,800
Behavioral Health Physician Assistants	1,800	1,350	450	1,690	110
Clinical, Counseling, and School Psychologists	188,930	197,150	-8,220	246,420	-57,490
Substance Abuse and Behavioral Disorder Counselors	105,970	98,040	7,930	122,510	-16,540
Mental Health and Substance Abuse Social Workers	109,220	126,160	-16,940	157,760	-48,540
Mental Health Counselors	145,700	138,170	7,530	172,630	-26,930
School Counselors	243,450	257,190	-13,740	321,500	-78,050
Marriage and Family Therapists	29,780	32,220	-2,440	40,250	-10,470

National Council Medical Director Institute Released report:

The Psychiatric Shortage Causes and Solutions
March 28 2017

Report highlights causes and possible solutions for current shortage of providers in the field of psychiatry

https://www.thenationalcouncil.org/wp-content/uploads/2017/03/Psychiatric-Shortage_National-Council-.pdf

MENTAL HEALTH FIRST AID
NATIONAL COUNCIL
FOR BEHAVIORAL HEALTH
Healthy Minds. Strong Communities.

Due to efficient screening for mental health and Substance Use Disorders in primary care, there will be growing demand for access in psychiatric services

Current issues:
- Providers face a cramped daily routine with increased brief appointments scheduled back to back that limit in-depth clinical assessment.
- Lack of psychiatric services in ED
- Shrinking number of inpatient psychiatric services

Workforce:
- Declining pool of practitioners working in public sector
- geographically Uneven distribution of workforce
- Aging of current workforce
- 40 % of providers are in Cash only private practice

RECOMMENDATIONS

The Medical Director Institute Proposes solutions as critical steps toward realizing the vision of psychiatrists participating up to their level of licensure in a range of clinical settings

- Train future psychiatry workforce with emphasis tele psychiatry
- Workforce development
- Improved efficiency of service
- Reducing burdensome regulations and confidentiality restrictions
- Broader implementation of innovative models
- Novel reimbursement for psychiatric services
- **Expanding tele psychiatry by reducing regulatory barriers and reimbursing adequately**

- " **TELEPSYCHIATRY**, including "**TELE-TEAMING**," should be widely adopted to address the geographical maldistribution of psychiatrists and used in multiple settings, including medication clinics, collaborative care in primary care offices, EDs, correctional setting and schools to address shortages"

- "Within these innovative models of care are opportunities to expand access using video technology and electronic communication:

- Remove regulatory barriers to broader use of **TELEPSYCHIATRY.** The national trade associations must press state and federal agencies for clarity on these regulations.

- Payers need to reimburse adequately for **TELEPSYCHIATRY** and other models of remote communication (such as apps to monitor psychiatric symptoms and communicate remotely with providers to address more complex triggers)."

RECOMMENDATIONS

ADVANTAGES OF TELEPSYCHIATRY

- **TELEPSYCHIATRY** has the potential to dramatically increase geographic access to psychiatric services for children and adults in rural areas.

- To the extent that **TELEPSYCHIATRY** eliminates travel time, there is a corresponding increase in psychiatrist productivity when they are able provide psychiatric services during time that they would have previously spent traveling to a clinic location.

- People, especially younger people, increasingly want treatment interventions on-demand without scheduling an appointment, and often not face-to-face in an office.

TELEPSYCHIATRY REGULATIONS

- The growing acceptance of **telepsychiatry** has enabled timely access to psychiatric care in areas of the country where there are significant provider shortages.

- Although telepsychiatry has become a clinically accepted modality of care, federal and state laws and regulations have been inconsistent in keeping pace with telepsychiatry's growth

- The Interstate Medical Licensure Compact is a new medical licensing option to remove one of the significant impediments to telepsychiatry. Physicians who seek a medical license to practice medicine in multiple states will be eligible for an expedited medical license in all participating states.

RECOMMENDATIONS

TREATMENT METHODS

History of mental health and treatment methods and their impact on built environment
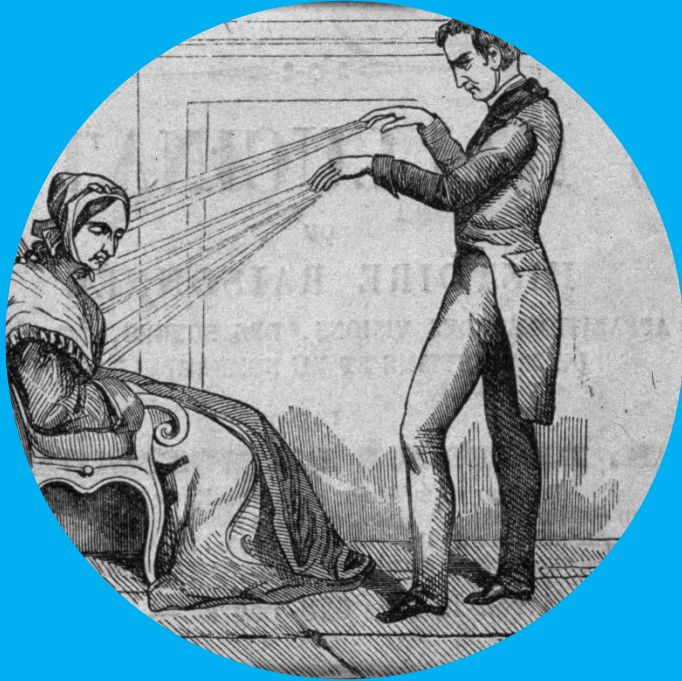
A practitioner of mesmerism using animal magnetism on a woman who responds with convulsions. Wood engraving. Mesmer, Franz Anton 1734-1815.
Credit: Wellcome Collection. CC BY

A doctor listens to a patient digging into her past at the New York Psychoanalytic Institute Treatment Center in New York, April 25, 1956
Photo source: Associated Press; AP-55383377

?

ASYLUMS

The first psychiatric hospital in the world was founded in Valencia, Spain, in 1406

START OF "HUMANE TREATMENT"

1792, Phillippe Pinel "the founder of moral treatment," which it describes as "the cornerstone of mental health care in the 1800s." to that effect, he took ownership of the famous *Hospice de Bicêtre* In Paris France

1800'S STARTED HOSPITAL MOVEMENT

William Tuke-York retreat Dorothy Dix- United states who advocated the hospital movement and in 40 years, got the U.S. government to fund the building of 32 state psychiatric hospitals as well as organizing reforms in asylums across the world

START OF PSYCHOANALYSIS

1900's Psychoanalysis proved influential enough that around 25 percent of practicing therapists use methods developed by Sigmund Freud

1963- (MHA) Mental Health America U.S. Community Mental Health Centers Act of 1963" to improve lives of the mentally Ill in United States" reform that triggered increase in psychoanalysis

THE RISE AND FALL OF ELECTROCONVULSIVE THERAPY

Somatic treatment- Psycho Pharmacology and electric Shock therapy Introduction of pharmacology led to deinstitutionalization reform which changed the view from institutionalized care to "community-oriented care" to improve the "quality of life" this backfired and led to 1/3 of the homeless population being the mentally ill.

1949 AN AUSTRALIAN PSYCHIATRIST INTRODUCED THE DRUG LITHIUM INTO THE MARKET

lithium alongside with Prozac, Thorazine and Valium became the standard for mental health treatment during the middle and latter decades of the 20th century, An unexpected side effect of people with severe mental health problems, but with no social or family networks to support their recovery (or with no insurance plans for rehabilitation) being moved to the streets, jails and prisons

INFLUENCE OF TREATMENT METHODS ON ARCHITECTURE AND BUILT ENVIRONMENT

"Humane Treatment" Movement

Hospital Movement 1800s

lithium alongside with Prozac, Thorazine and Valium became the standard for mental health treatment

Asylums

Hospitals

Residential setting

1429 Ospedale Degli Innocenti by Brunelleschi
Florence, Italy

Editorial credit: / Shutterstock.com
Image ID: 1237722046

St. Elizabeth's 1852-2017 is now closed Washington D.C. By Thomas U. Walter

(Photo credit: National Library of Congress, National Photo Company Collection
Digital ID: (b&w film copy neg.) cph 3c04691
http://hdl.loc.gov/loc.pnp/cph.3c04691
Reproduction Number: LC-USZ62-104691 (b&w film copy neg.)

Betty ford rehabilitation center Established in 1982

Image: Google earth

FROM ASYLUMS, ELECTROSHOCK AND PILLS

TO SCIENCE FICTION ?

Allison, Sun Parlor, 1910; National Archives Catalog; 5664435; local identifier: 418-G-15; Department of Health, Education, and Welfare. St. Elizabeth's Hospital. 4/11/1953-8/9/1967 https://catalog.archives.gov/id/5664435

Dr. Ashby's Toner Building (Old Electric Spark Machine) 1870-1920. national archives Catalog :5664718; local identifier:418-G-313; Department of Health, Education, and Welfare. St. Elizabeth's Hospital. 4/11/1953-8/9/1967 https://catalog.archives.gov/id/5664718

National Museum of Health and Medicine via Flickr https://www.flickr.com/photos/medicalmuseum/3299318697 Bergonic chair for giving general electric treatment (Reeve 041476)

Winwick Hospital, Electroconvulsive therapy, 1957 Photo: University of Liverpool Faculty of Health & Life Sciences https://www.flickr.com/photos/liverpoolhls/14466087218

HUGO GERNSBACK WITH HIS 3D TV EYEGLASSES Photo credit: James Vaughan via Flickr: https://www.flickr.com/photos/x-ray_delta_one/4265173624

EVOLUTION OF TREATMENT TOOLS

A doctor listens to a patient digging into her past at the New York Psychoanalytic Institute
Treatment Center in New York, April 25, 1956
Photo source: Associated Press; AP-55383377
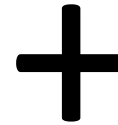
MERGE OF TECHNOLOGY WITH TREATMENT METHODS

NEW TOOLS ARE NO LONGER A SCIENCE FICTION

A traumatic brain injury patient walks through a virtual reality scenario at the Computer Assisted Rehabilitation Environment Laboratory at National Intrepid Center of Excellence at Walter Reed National Military Medical Center in Bethesda, Md., March 20, 2017. The patient is attached to a safety harness and walks on a treadmill on a platform that moves and rotates in conjunction with movements of the projected environment. Motion capture cameras track the patient's movements via reflective markers that are applied to the patient and supply data on physical deficits to physical therapists. Air Force photo by J.M. Eddins Jr.
"The appearance of U.S. Department of Defense visual information does not imply or constitute DOD endorsement."
https://dod.defense.gov/Photos/Photo-Gallery/igphoto/2001739700/

Senior Airman Joseph Vargas, a pharmacy technician with the 779th Medical Support Squadron, uses the Virtual Iraq program at Malcolm Grow Medical Center's Virtually Better training site on Andrews Air Force Base, Md. on June 25, 2009. Exposure therapy is a type of therapy that helps patients confront and overcome the incidents that scarred them. (U.S. Air Force photo by Senior Airman Renae Kleckner)(released)
https://www.jba.af.mil/News/Photos/igphoto/2000533763/

Licensed Professional Counselor - Mental Health Service Provider Shaine Malekgoodar, seen in monitor screen, can connect with Hope Family Health patients in Westmoreland, TN, its sattelite locations, or at home, when using the high-speed fiberoptic cable network of North Central Telephone Cooperative Corporation (NCTC), headquartered in Lafayette, TN, on Sept. 27, 2018. USDA Photo by Lance Cheung
https://www.flickr.com/photos/usdagov/44259432045

Multiple trials and studies testing Virtual Reality tools in the treatment of Mental Health Disorders.

Vast data of clinical trials suggest that the new method of treatment showed a high success rate in a relatively short period.

USC INSTITUTE FOR CREATIVE TECHNOLOGIES
Albert "Skip" Rizzo and his team are conducting fascinating trials addressing Mental Health Disorders. Their programs such as Sim Coach, which serves as virtual human and consults patients, Virtual Iraq/Afghanistan Therapy to address PTSD disorders, And many more studies

OXFORD UNIVERSITIES OXFORDVR LAB lead by Dr. Daniel Freeman conducts multiple studies addressing several disorders, such as fear of heights, Psychosis, social anxieties and more.

EVEN LAB, DEPARTMENT OF CLINICAL PSYCHOLOGY AND PSYCHOBIOLOGY OF UNIVERSITY OF BARCELONA lead by Dr. Mel Stater conducts multiple studies addressing social disorders

USC Institute for Creative Technologies

ARL

oxfordvr
Immersive technology for mental health

EVENT LAB
Entorns Virtuals En Neurociències i Tecnologia
Entornos Virtuales En Neurociencias y Tecnología
Experimental Virtual Environments for Neuroscience and Technology

eventLAB
Neuroscience
& Technology

Medical Virtual Reality

The ICT MedVR Lab explores and evaluates areas where VR can add value over traditional assessment and intervention approaches. Areas of specialization are in using VR for mental health therapy, motor skills rehabilitation, cognitive assessment and clinical skills training

http://medvr.ict.usc.edu/

Psychologist Skip Rizzo conducts research on the design, development and evaluation of virtual reality (VR) systems targeting the areas of clinical assessment, treatment rehabilitation and resilience. This work spans the domains of psychological, cognitive and motor functioning in both healthy and clinical populations.

SimCoach

SimCoach is a web-based virtual human designed to provide an *anonymous* and *accessible* way to overcome some of the existing resistance to seeking care, to facilitate communication about mental health issues, and to help soldiers, veterans and their families to realize that there are resources available for them. SimCoach can ask a series of questions about the user's symptoms and provides access to relevant resources.

Virtual Iraq/Afghanistan

Virtual Iraq/Afghanistan, delivers virtual reality exposure therapy for treating post-traumatic stress. Currently in use at over 60 clinical sites, including VA hospitals, military bases and university centers the *Virtual Iraq/Afghanistan* exposure therapy approach has been shown to produce a meaningful reduction in PTS symptoms.

Stress Resilience In Virtual Environments (STRIVE)

STRIVE is a pre-deployment approach to understanding and training troops for combat stress. It includes a realistic combat experience portrayed within a virtual reality story and an interaction with an intelligent virtual mentor that can explain how the brain and the body react to stress and present relevant exercises for managing it.

Games for Rehabilitation

ICT's Games for Rehab Lab focuses on the creation of virtual reality and game-based tools that can improve both assessment and training. Current prototypes include *Jewel Mine*, a rehabilitation therapy tool designed to motivate patients with stroke, traumatic brain or spinal cord injuries.

MODEL OF CARE

As history shows, the treatment method informs the physical setting of care. What is the future model of care and how it may change our reality?
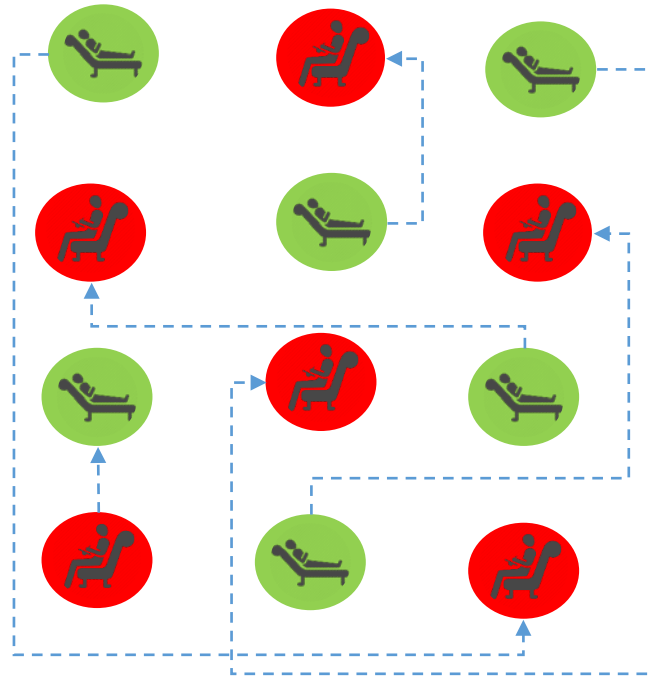
CURRENT MODELS
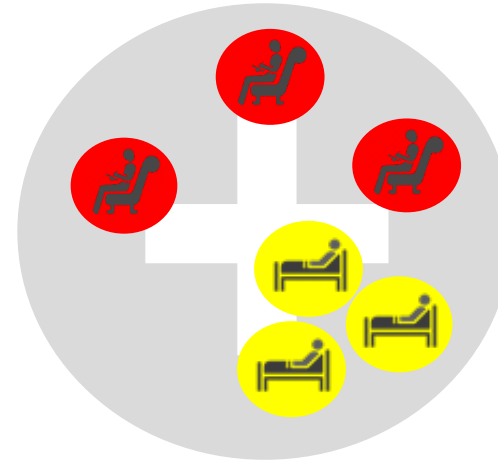(based on physical location of patient and provider)
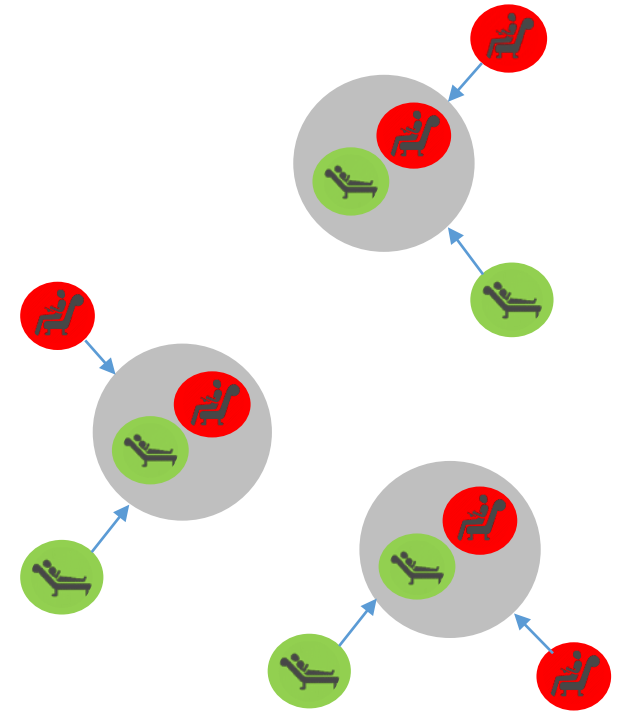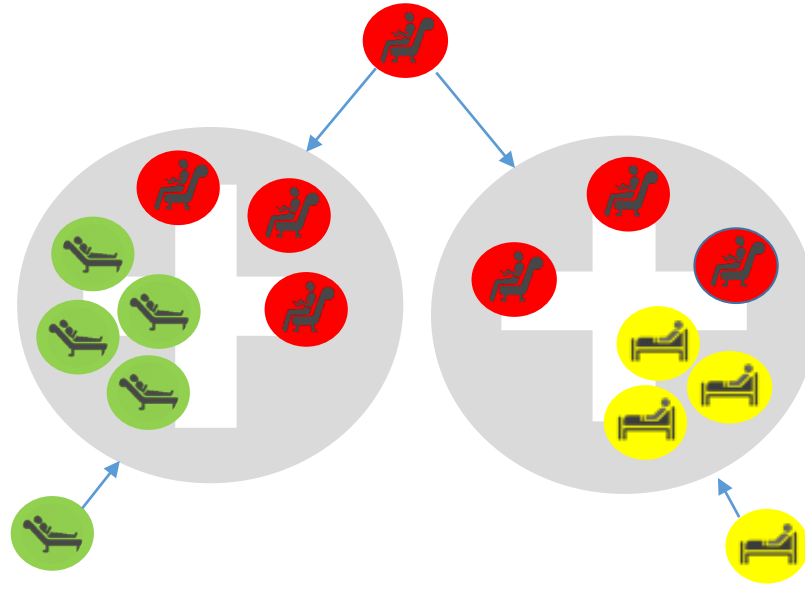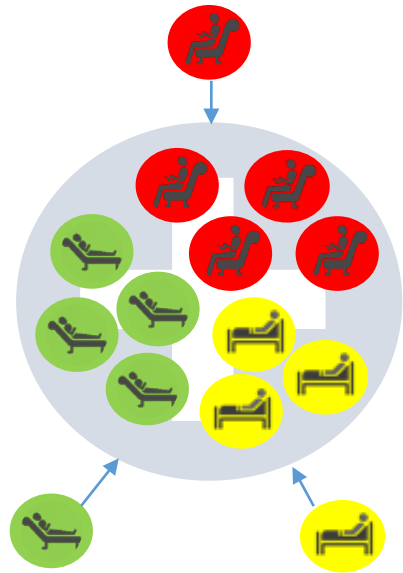
Patients

Providers

Critical patients requiring hospitalization

Hospitals and Clinics

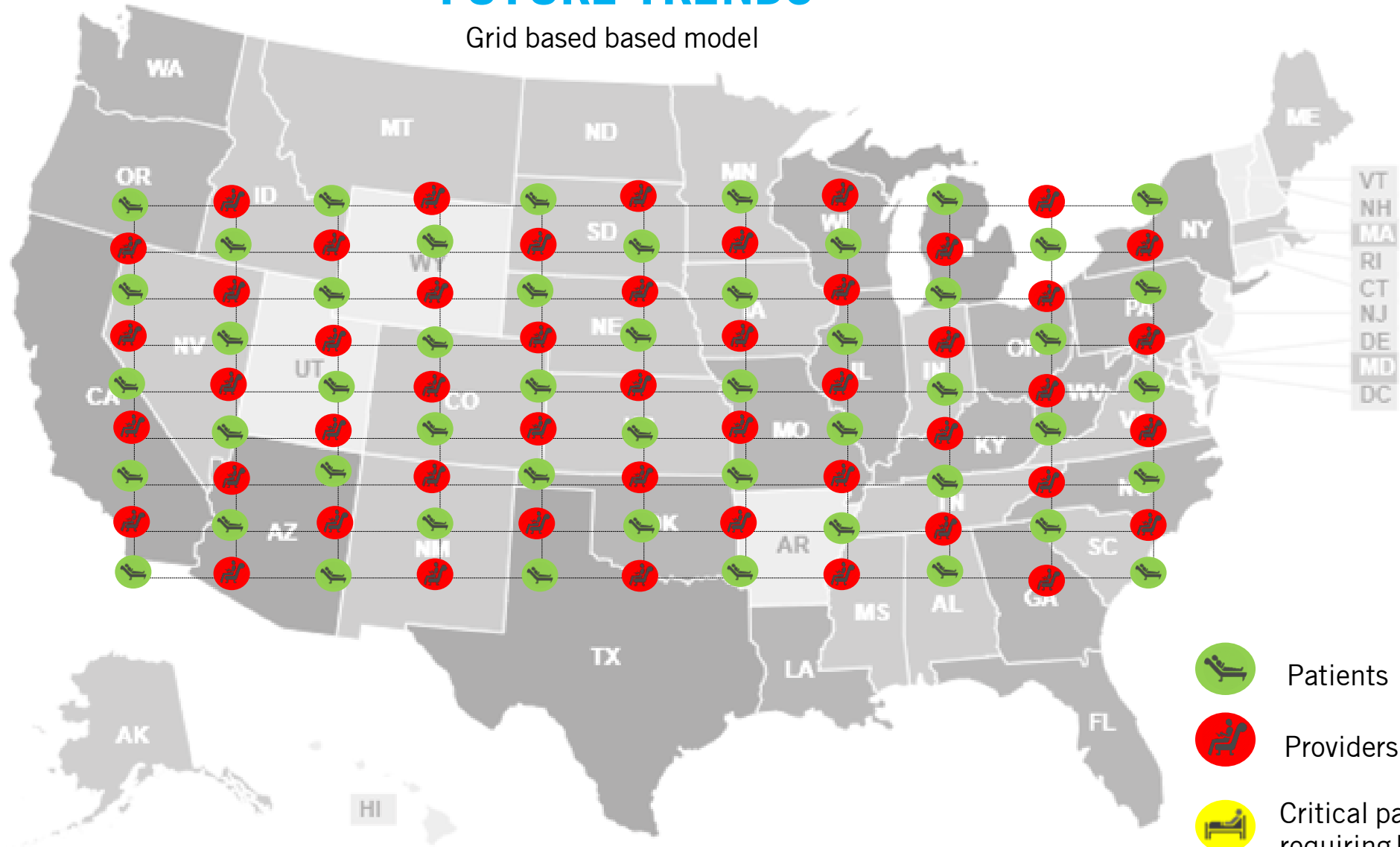# FUTURE TRENDS

Telemedicine based model

Critical patients only

Legend:
- Patients
- Providers
- Critical patients requiring hospitalization
- Hospitals and Clinics

FUTURE TRENDS

Grid based based model

Patients

Providers

Critical patients requiring hospitalization

Hospitals and Clinics
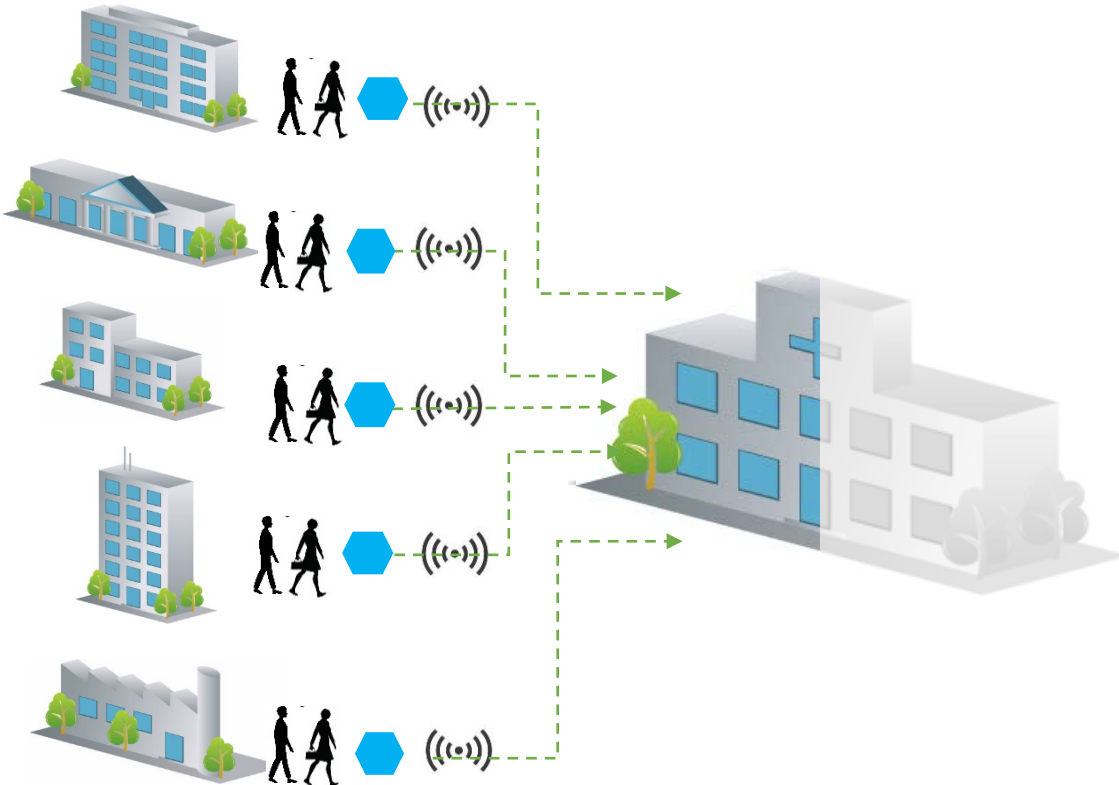
INFLUENCE ON CODES AND REGULATIONS

As Telemedicine becomes the standard method of treatment, built environment will be forced to adopt. Subsequently, it will affect building codes and regulations to standardize new functions in the buildings or urban network

CURRENT STATE
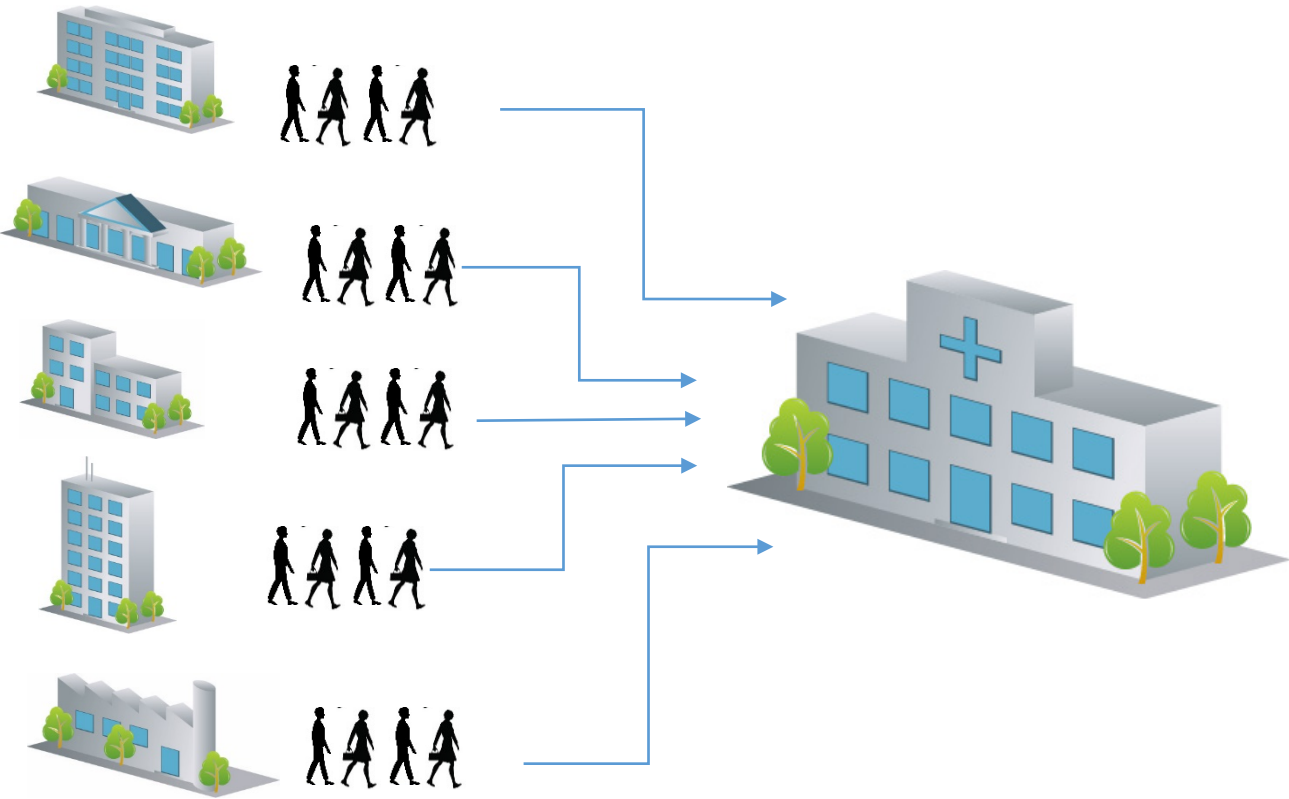
FUTURE STATE

High load on centralized health clinics, increased size and footprint of the built environment
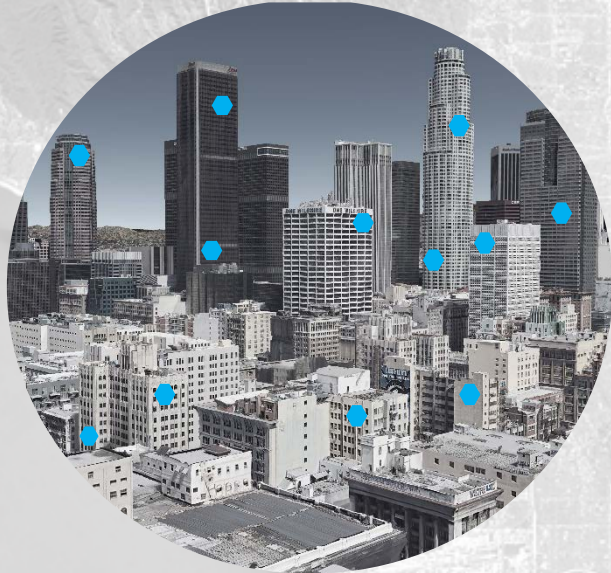
Decreased size and footprint of centralized clinics and integration of clinical touch points in Civic Buildings

INFLUENCE ON CODES AND REGULATIONS

Adding health cell

Clinical touchpoints become integrated into civic buildings, schools, residential buildings
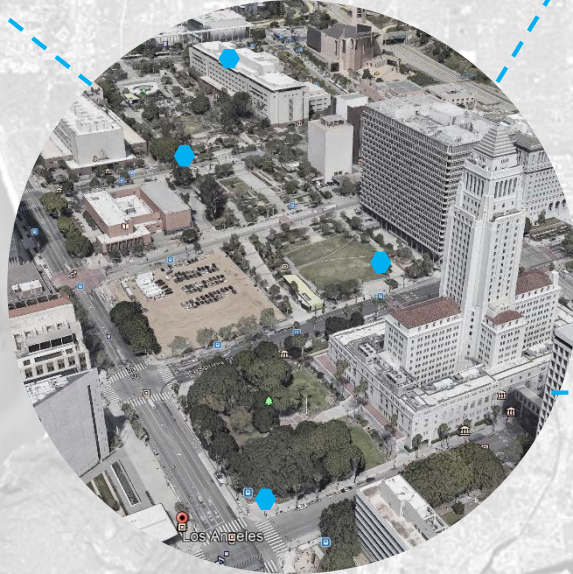
DOWNTOWN/BUSINESS CENTER

SKID ROW/HIGH CRIME AREAS / HOMELESS AND SHELTERS

RURAL AREAS

PARKS / RECRIATION

SCHOOLS / UNIVERSITIES

PLACEMENT/LOCATION TYPES
Los Angeles example

Images: Google earth

PLACEMENT/LOCATION TYPES
Global example

MAKESHIFT REFUGEE CAMPS

Insecticide treated blankets trial at refugee camp. Credit: M Rowland. CC BY Welcome images collection

WAR ZONE

Iraq, urban area, nasiriyah, city harj
https://pxhere.com/en/photo/1167712

TERROR ATTACK ZONE

2016 Berlin Christmas market truck attack
Möglicher-Terroranschlag-Berlin (27) Andreas Trojak

NATURAL DISASTER ZONE

new orleans, 2005, residential area, hurricane katrina
https://pxhere.com/en/photo/1347719

CIVIL UNREST

Euromaidan in Kiev, 19 February 2014. Labor Unions' House on fire. It was reportedly set afire by policemen[1] as it was a protesters' headquarters.
Author: Amakuha
Source: From Wikimedia Commons, the free media repository
https://commons.wikimedia.org/wiki/File:Euromaidan_in_Kiev_2014-02-19_12-06.jpg

MIGRATION CRISIS ZONE

refugee camp, somalis, displaced
https://pxhere.com/en/photo/1130379

FIRE ZONE

https://pxhere.com/en/photo/1073932

ARMY BASE

Forward Operating Base Salerno sits in "the bowl" surrounded by mountains that peak as high as 10,000 feet. The base serves as the headquarters for Combined Task Forces Currahee, a 5,000-strong NATO force made up of U.S. and Czech Republic troops. Defense Dept. photo by Fred W. Baker III
"The appearance of U.S. Department of Defense visual information does not imply or constitute DOD endorsement."

THE CAPSULE

PROTOTYPE I

FREE STANDING OUTDOOR UNIT

Section view (left):

- SENSOR CAMERAS
- CEILING HUNG VR HEADSET
- SKYLIGHT
- SOLAR PANEL
- SYNTHETIC TEXTURE ADJUSTABLE SURFACE FOR TACTILE SIMULATIONS
- FOLD DOWN CHAISE
- TOUCH PAD PANEL
- AROMA/SMELL SIMULATION DIFFUSERS
- LCD SCREEN
- FOLD DOWN BALANCING RING, HOUSED UNDERSIDE OF SEAT
- MOVEMENT SIMULATION FLOOR SYSTEM
- VIBRATION SIMULATION SPRINGS
- POWER FEED AND SERVICES
- 8' - 0"
- 3' - 0"
- 1' - 5"
- Level 1   0' - 0"
- GROUND LEVEL   -1' - 5"

Rendered elevation (right top):

- SLIDING GLASS DOORS
- ALUMINUM SHELL WITH SOLAR PANELS
- METAL STEPS
- 9' - 7 1/2"
- Level 1   0' - 0"
- GROUND LEVEL   -1' - 5"

Plan view (left bottom):

- VR HEADSET/GOOGLES
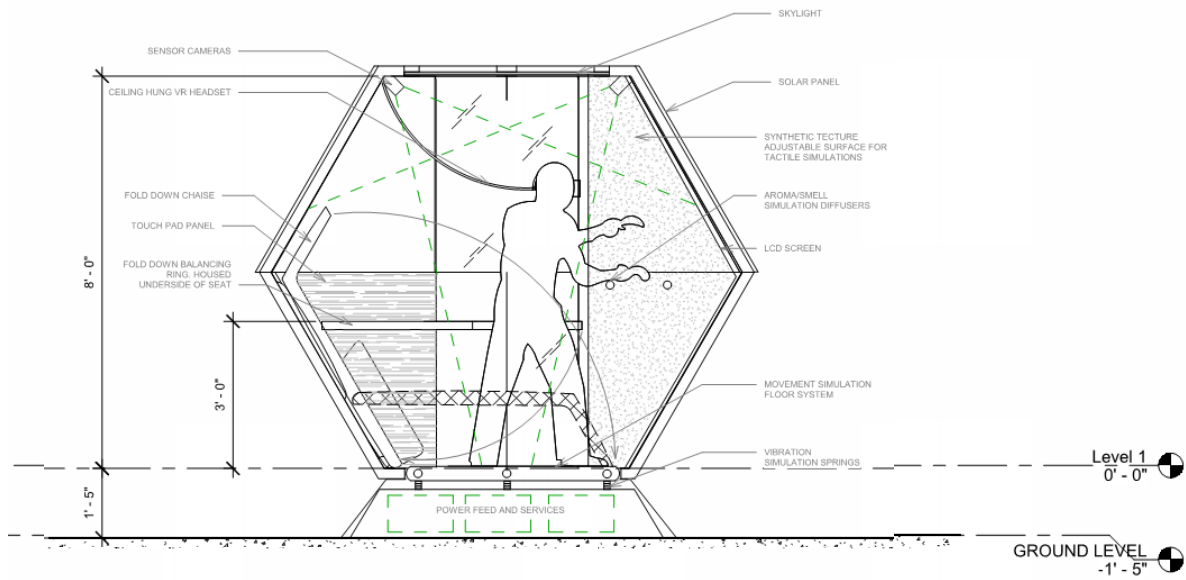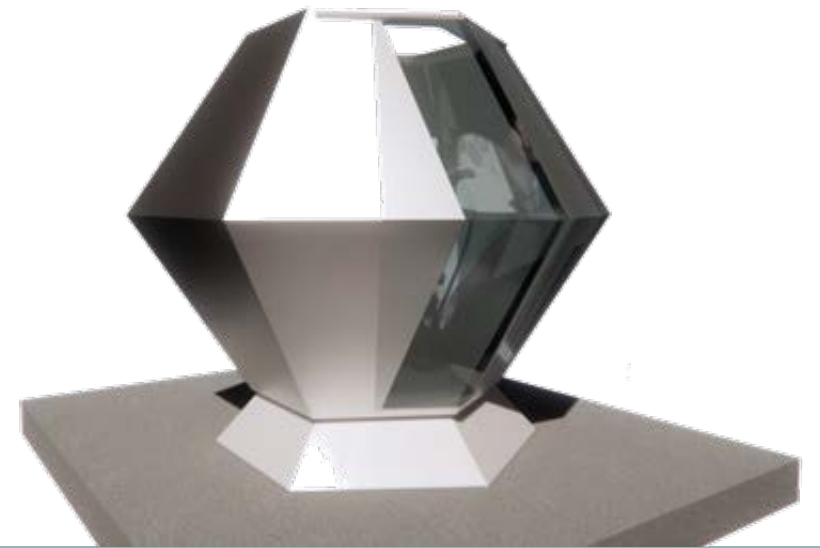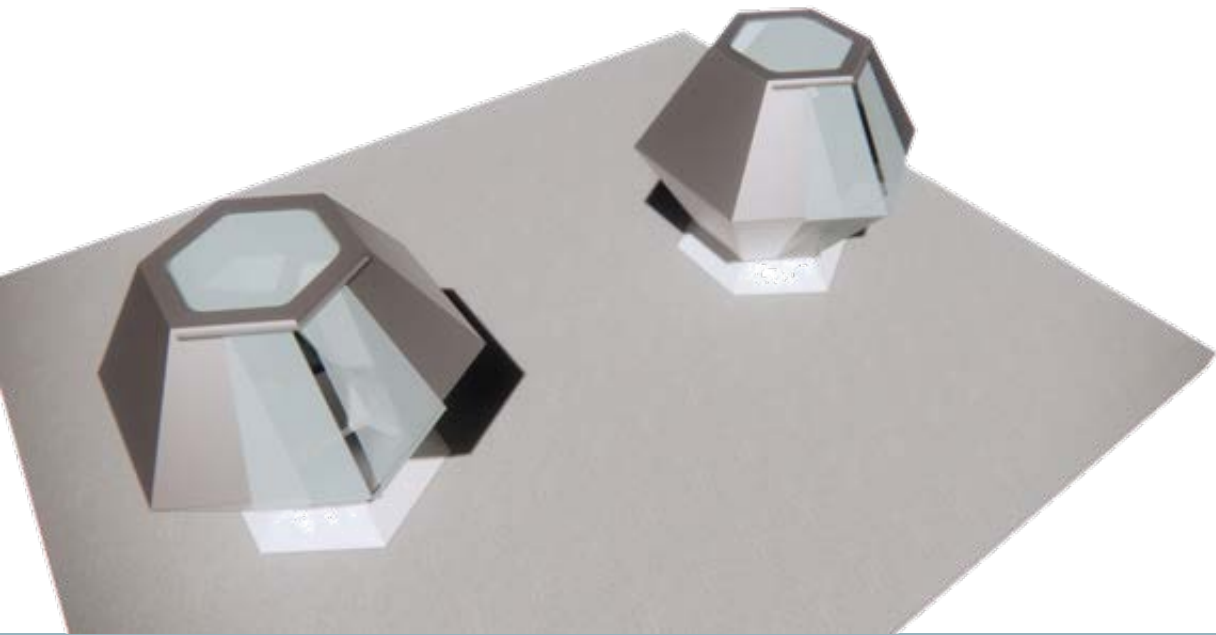- LEFT HAND CONTROLLER GLOVE
- RIGHT HAND CONTROLLER GLOVE
- TOUCH SCREEN SWITCH BOARD
- FOLDUP CHASE LOUNGE/ WITH FOLDABLE ARMS AND BUILT IN CONTROLLERS IN ARMS
- SLIDING DOORS WITH SWITCHABLE GLASS
- HEART RATE AND BLOOD PRESSURE MONITOR TOUCH SCREEN
- TOUCH PAD ACCESS PANEL
- SWITCHABLE GLASS VISION PANEL
- EXHAUST AIR
- SUPPLY AIR
- AROMA/SMELL DIFFUSER
- SYNTHETIC TEXTURE ADOPTING MATERIAL *
- MONITOR SURFACE
- 2' - 8 1/2"
- 3' - 0"
- 5' - 0"
- 10' - 1"
- R 5' - 10"

Axonometric plan (right bottom):

- CHASE LOUNGE IN PULL UP POSITION
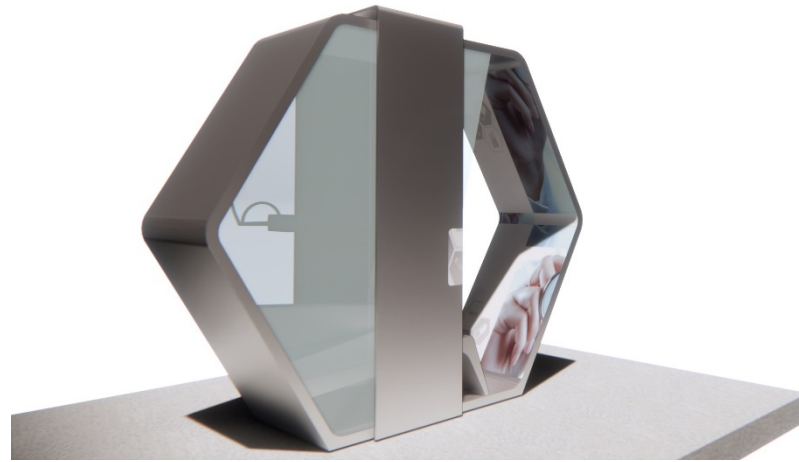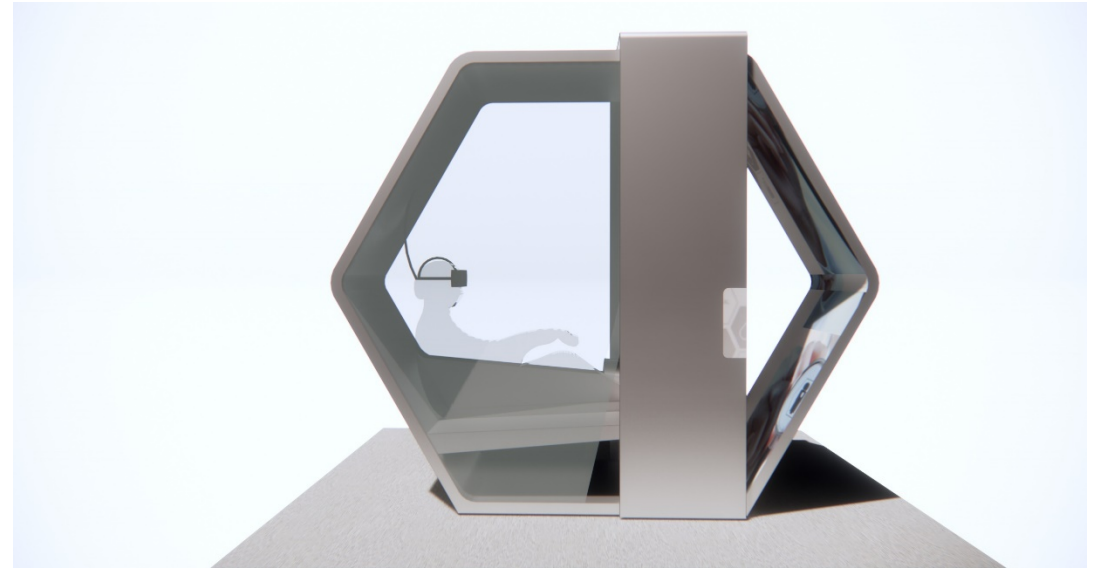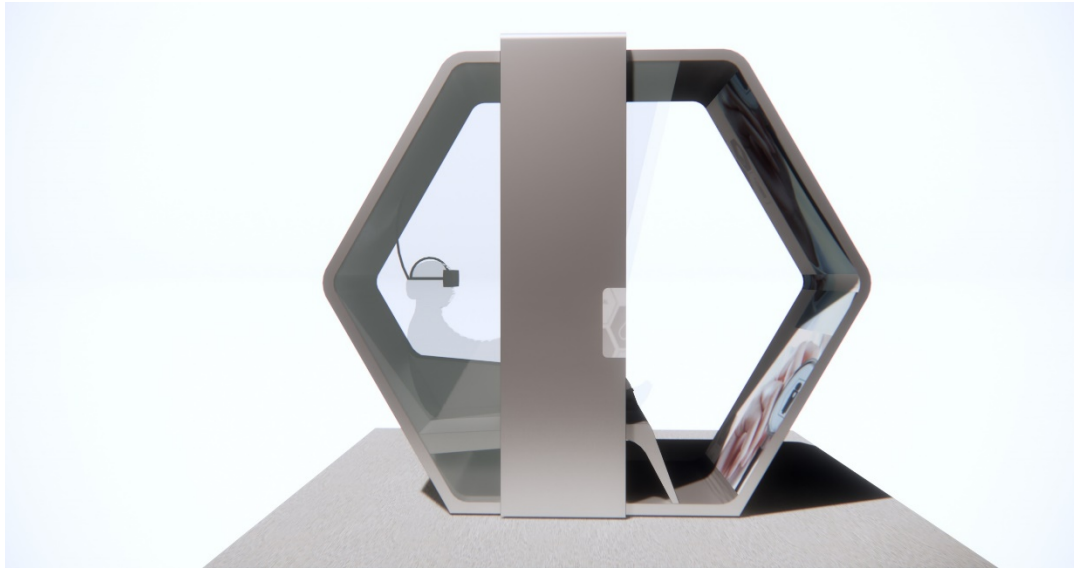- PULL DOWN BALANCING RING
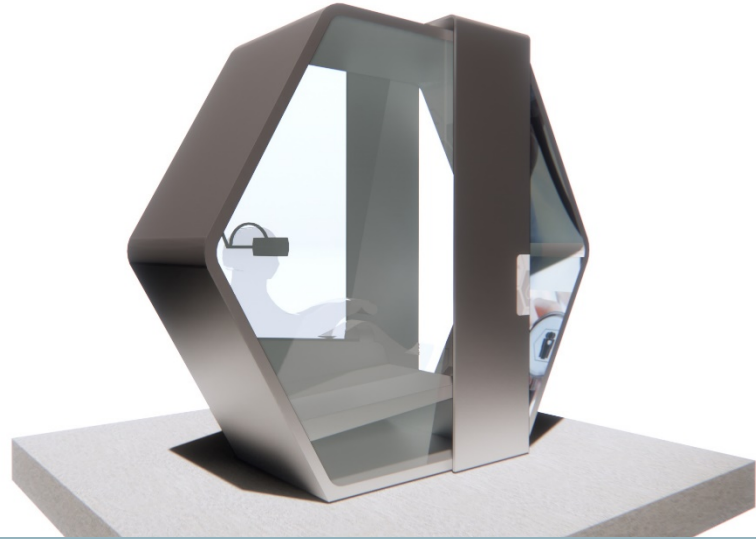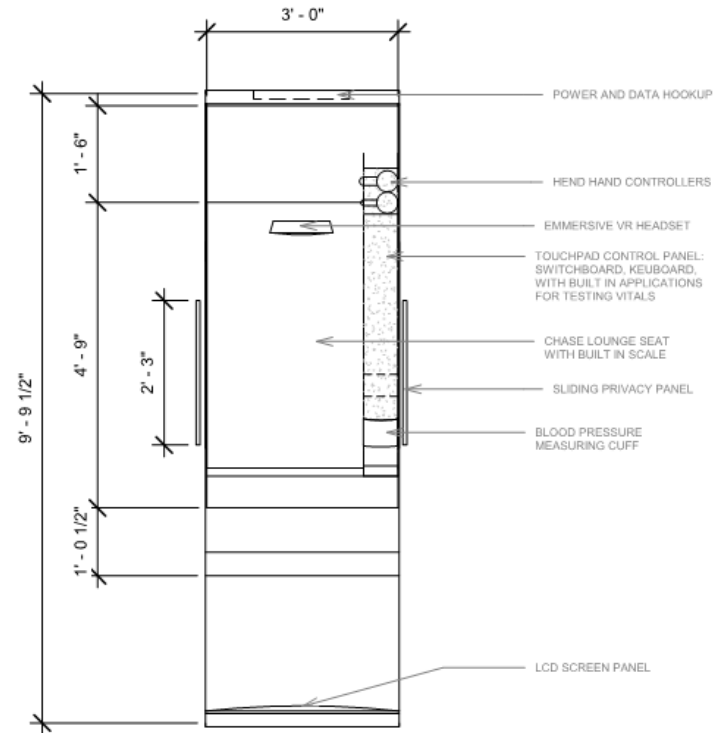- MOVING FLOOR SURFACE (WALKING SIMULATION)

MODULAR UNIT COMBINATION AND GROUPING OPTIONS
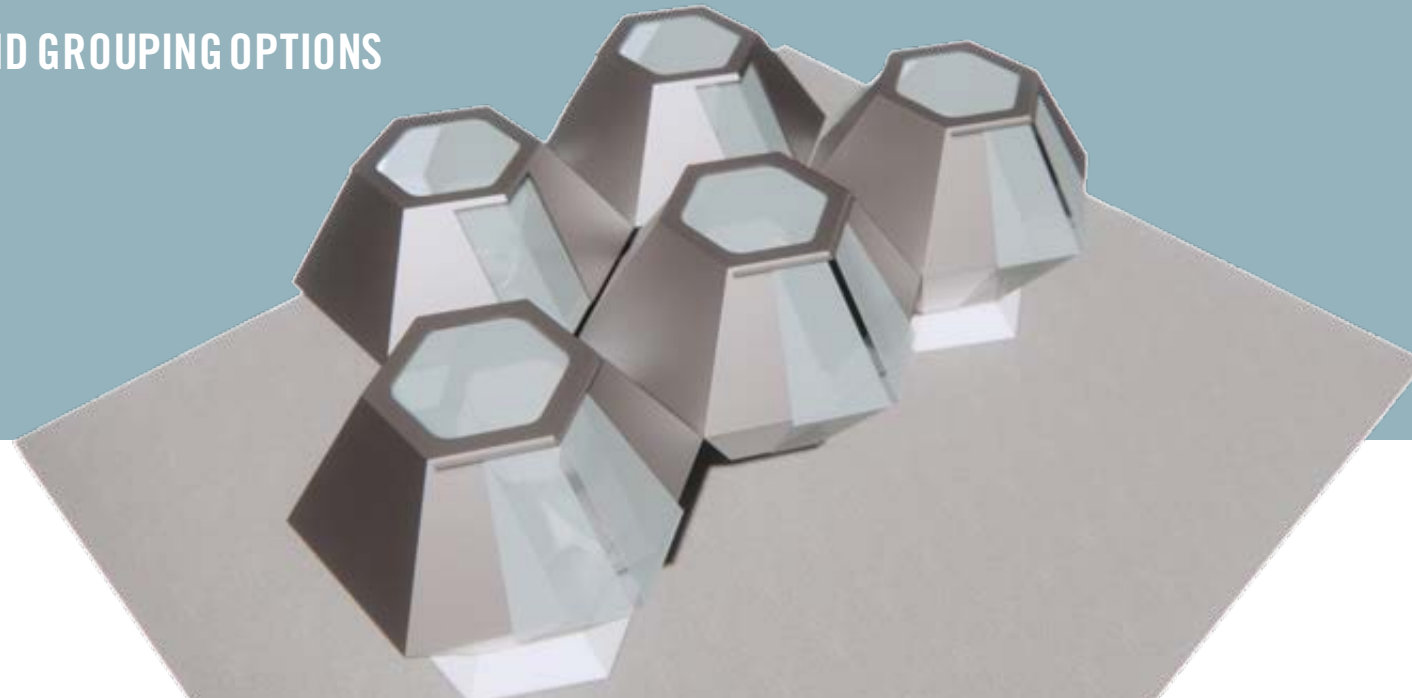
THE CAPSULE

PROTOTYPE II

INDOOR INTEGRATED UNIT

Left elevation (side view):

- RECESSED LED PANEL
- MONITORING CAMERA WITH MOTION SENSOR FOR VR SYSTEM
- ALUMINUM FRAME
- LCD SCREEN
- EQUIPEND WITH SOUND CANCELING TECHNOLOGY
- VR HEADSET
- POWER AND DATA HOOKUP PANEL
- TOUCH PAD CONTRIL PANEL TOP OF SEAT ARM
- BLOOD PRESSUR CUFF
- CHASE LOUNGE SEAT W/ BUIL IN SCALE
- 8' - 9"
- 8' - 0"
- Level 1 0' - 0"

Right elevation:

- SLIDING PRIVACY SCREEN
- SWITCHABLE GLASS SCREEN
- ALUMINUM FRAME
- TOUCH PAD, SWITCH PANEL
- 8' - 5 1/2"
- Level 1 0' - 0"

Plan / section (bottom):

- 3' - 0"
- POWER AND DATA HOOKUP
- HEND HAND CONTROLLERS
- EMMERSIVE VR HEADSET
- TOUCHPAD CONTROL PANEL: SWITCHBOARD, KEUBOARD, WITH BUILT IN APPLICATIONS FOR TESTING VITALS
- CHASE LOUNGE SEAT WITH BUILT IN SCALE
- SLIDING PRIVACY PANEL
- BLOOD PRESSURE MEASURING CUFF
- LCD SCREEN PANEL
- 1' - 6"
- 4' - 9"
- 2' - 3"
- 9' - 9 1/2"
- 1' - 0 1/2"

CONCLUSION

Immersive Virtual Reality and Telemedicine is already in use by several Healthcare Institutions, but Architects and Designers, Governing Bodies, and Regulations may not be all in sync with the evolution of treatment methods.

Some States and Countries are more prepared than others. However, we are still designing centralized Clinics and Hospitals for physical interaction with minimal modifications to adapt to the new reality. Realistically we have not even been in a position to explore bold moves since governing, and regulatory agencies are still enforcing building codes and regulations written years ago.

Primary Care is starting to transition into Telemedicine, and as a standard to initial examination it incorporates Mental Health evaluation, which itself must increase detection of illness and demand on the treatment. Integration of robotics on a more mainstream level may streamline remote testing and treatment even more.

If assumptions and predictions are correct, we should expect a more disseminated model of care, where micro touchdown testing stations can be automated or equipped with telehealth capability. As a result, it is more likely that large clinical hubs could decrease in size, but micro-units may become integrated into a different typology of buildings or in urban and rural settings.

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5 Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain

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