HEALING

OUR PATH FROM MENTAL ILLNESS TO MENTAL HEALTH

THOMAS INSEL, MD

Thank you for your purchase of *Healing.* This pdf provides figures and tables to accompany the text. Many of these were edited out of the printed version of the book but I provide them here because they were helpful to me in writing the book and I hope will be of interest to you as you read the text or listen to the audiobook. Please let me know what you think. www.thomasinselmd.com

Thomas Insel, MD

It was said, in an earlier age, that the mind of a man is a far country which can neither be approached nor explored. But, today, under present conditions of scientific achievement, it will be possible for a nation as rich in human and material resources as ours to make the remote reaches of the mind accessible. The mentally ill … need no longer be alien to our affections or beyond the help of our communities.
—John F Kennedy, On signing the Community Mental Health Act, Oct 31, 1963

Healing Chapter One: Our Problem

Disability Adjusted Life Years - 2019
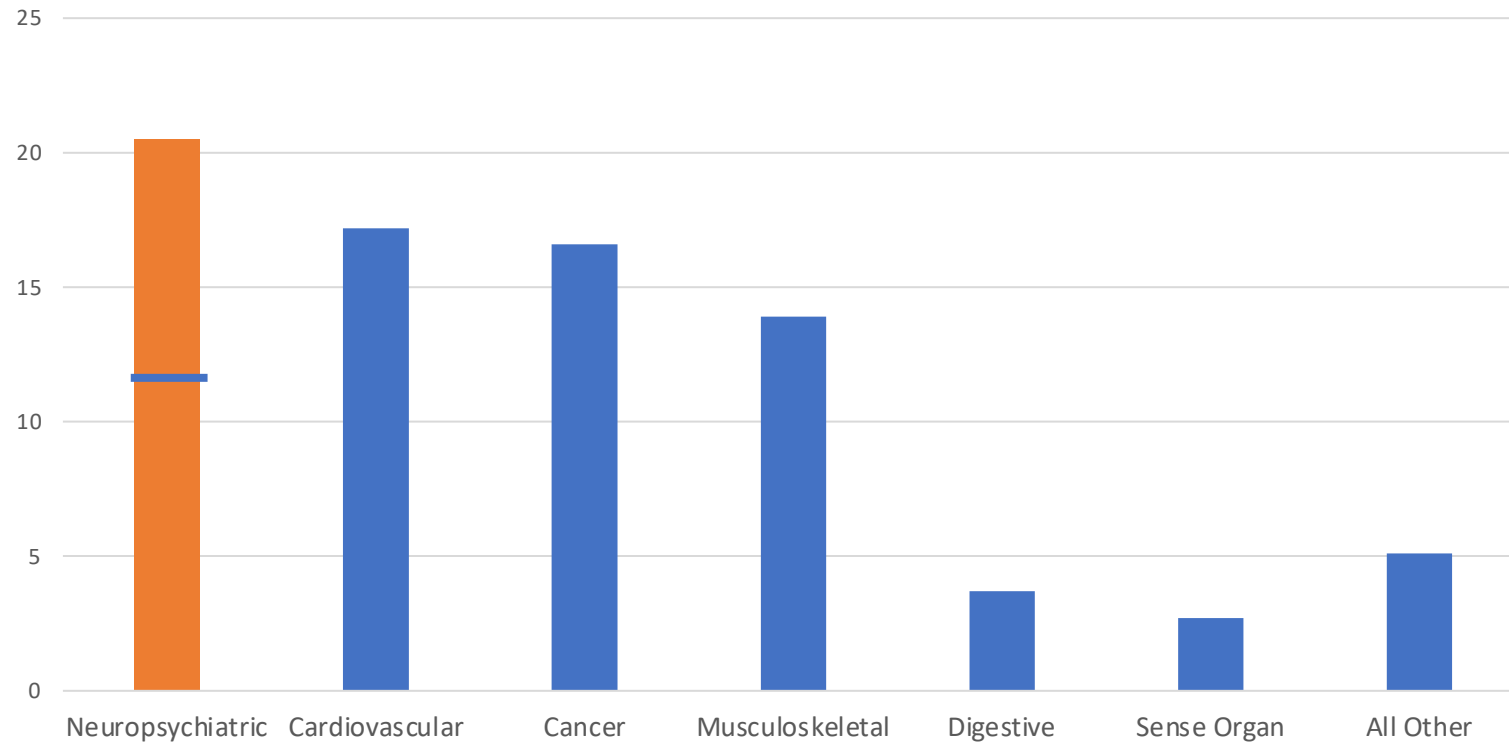**Non-Communicable Diseases - US**
All Ages

Fig 1.1 Disability adjusted life years (DALYs) yield a single number that combines years lost to premature death and chronic disability. The y-axis represents DALYs (in millions) for non-communicable (non-infectious) diseases in the U.S. in 2019. Neuropsychiatric combines mental disorders, substance use disorders, and neurological disorders. The line on this bar represents mental disorders and substance use disorders together. Data from Institute of Health Metrics and Evaluation. https://vizhub.healthdata.org/gbd-compare/
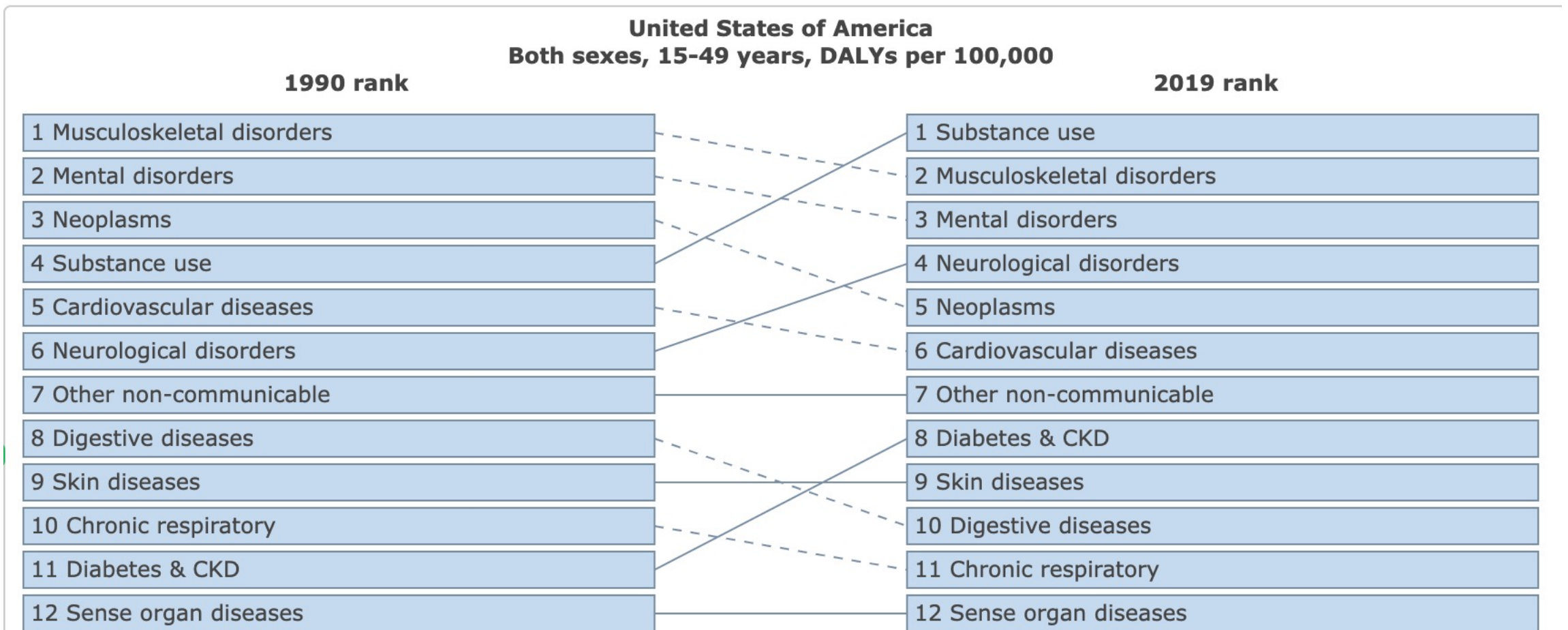
United States of America
Both sexes, 15-49 years, DALYs per 100,000

1990 rank	2019 rank
1 Musculoskeletal disorders	1 Substance use
2 Mental disorders	2 Musculoskeletal disorders
3 Neoplasms	3 Mental disorders
4 Substance use	4 Neurological disorders
5 Cardiovascular diseases	5 Neoplasms
6 Neurological disorders	6 Cardiovascular diseases
7 Other non-communicable	7 Other non-communicable
8 Digestive diseases	8 Diabetes & CKD
9 Skin diseases	9 Skin diseases
10 Chronic respiratory	10 Digestive diseases
11 Diabetes & CKD	11 Chronic respiratory
12 Sense organ diseases	12 Sense organ diseases

Fig 1.2 Disability adjusted life years (DALYs) represent a single number combining years lost to premature death and chronic disability. Figure shows rankings of DALYs from 1990 and 2019 across non-communicable diseases in the US for people from ages 15 – 49. Note the trend for neuropsychiatric diseases, representing 3 of the top 5 sources in 2019. Preliminary data from the Covid-19 pandemic suggest surge in mental disorders in 2020-2021. Data from Institute of Health Metrics and Evaluation. https://vizhub.healthdata.org/gbd-compare/

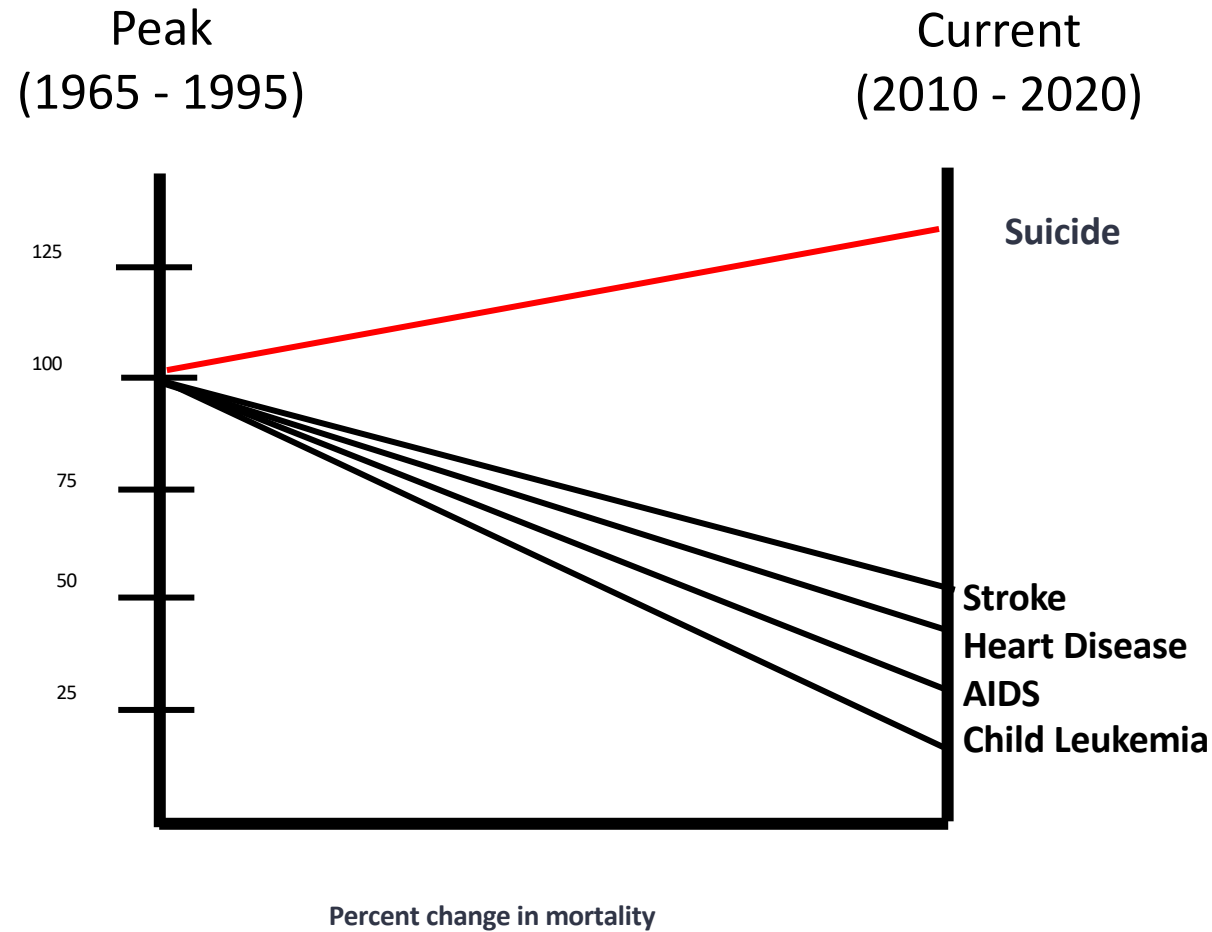# Suicide Deaths Have Increased Over 30% in the U.S.

Figure 1.3 Mortality as estimated from specific medical causes comparing reports over the past decade with peak rates of mortality in the 1965 -1995 era in the U.S.. The profound progress for several medical disorders has not been matched by reductions in suicide which have increased 33% since 2000. Not shown are marked increases in drug overdose deaths and reductions in homicides and auto fatalities relative to 1965-1995. (source CDC)

Deaths of Despair – Lowering Life Expectancy in America (before Covid-19)
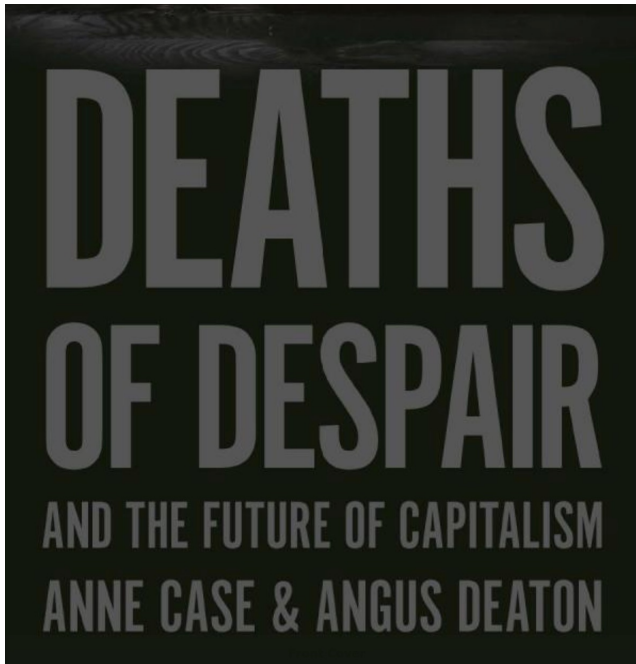
	2000	2019	2021*
Suicide:	29,350	47,511	45,855
Drug OD:	17,415	70,630	100,306
Alcohol:	19, 627	39,000	95,000**
TOTAL	66,392	157,141	241,161

Fig 1.4 Case and Deaton report on "deaths of despair" combining mortality from suicide, drug overdoses, and alcohol addiction. Increase (in the U.S) is largely among rural whites without a college degree. Data from CDC NVSS. *estimates up to May 2021, **data not comparable due to changes in criteria for alchohol-related deaths.

Engagement

~52.9 million people in the U.S. with any disorder; ~14.2 million "serious" (NSDUH)

40% Receive Services

Underserved

40% Receive Minimally Acceptable Care
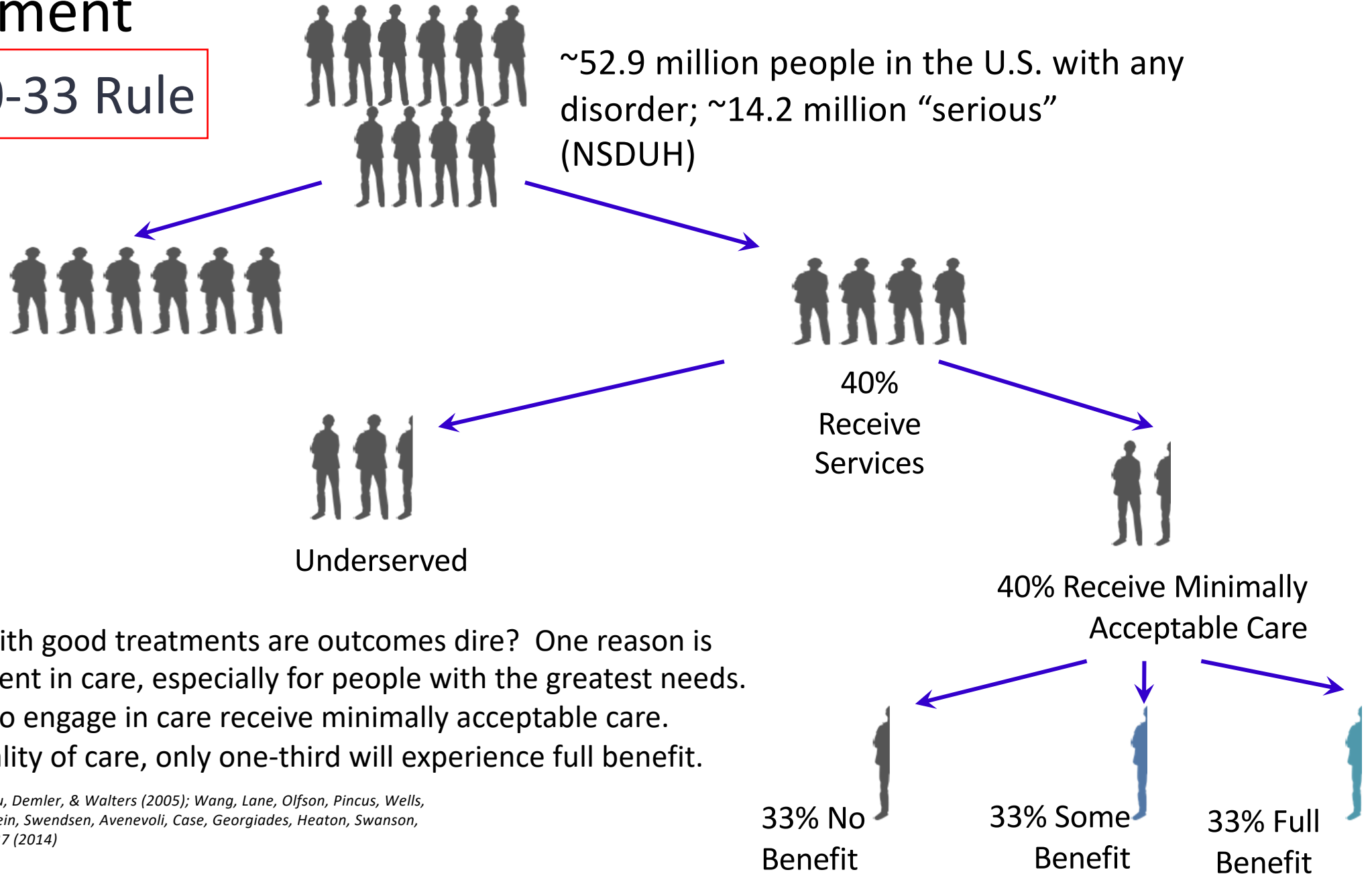
33% No Benefit

33% Some Benefit

33% Full Benefit

Figure 1.5 Why with good treatments are outcomes dire? One reason is the low engagement in care, especially for people with the greatest needs. And only 40% who engage in care receive minimally acceptable care. With this low quality of care, only one-third will experience full benefit.

SOURCES: NSDUH (2021); Kessler, Chiu, Demler, & Walters (2005); Wang, Lane, Olfson, Pincus, Wells, Kessler (2005); Merikangas , He, Burstein, Swendsen, Avenevoli, Case, Georgiades, Heaton, Swanson, Olfson (2011), SSA Publication 13-11827 (2014)

Healing Chapter Two: Alien to Our Affections
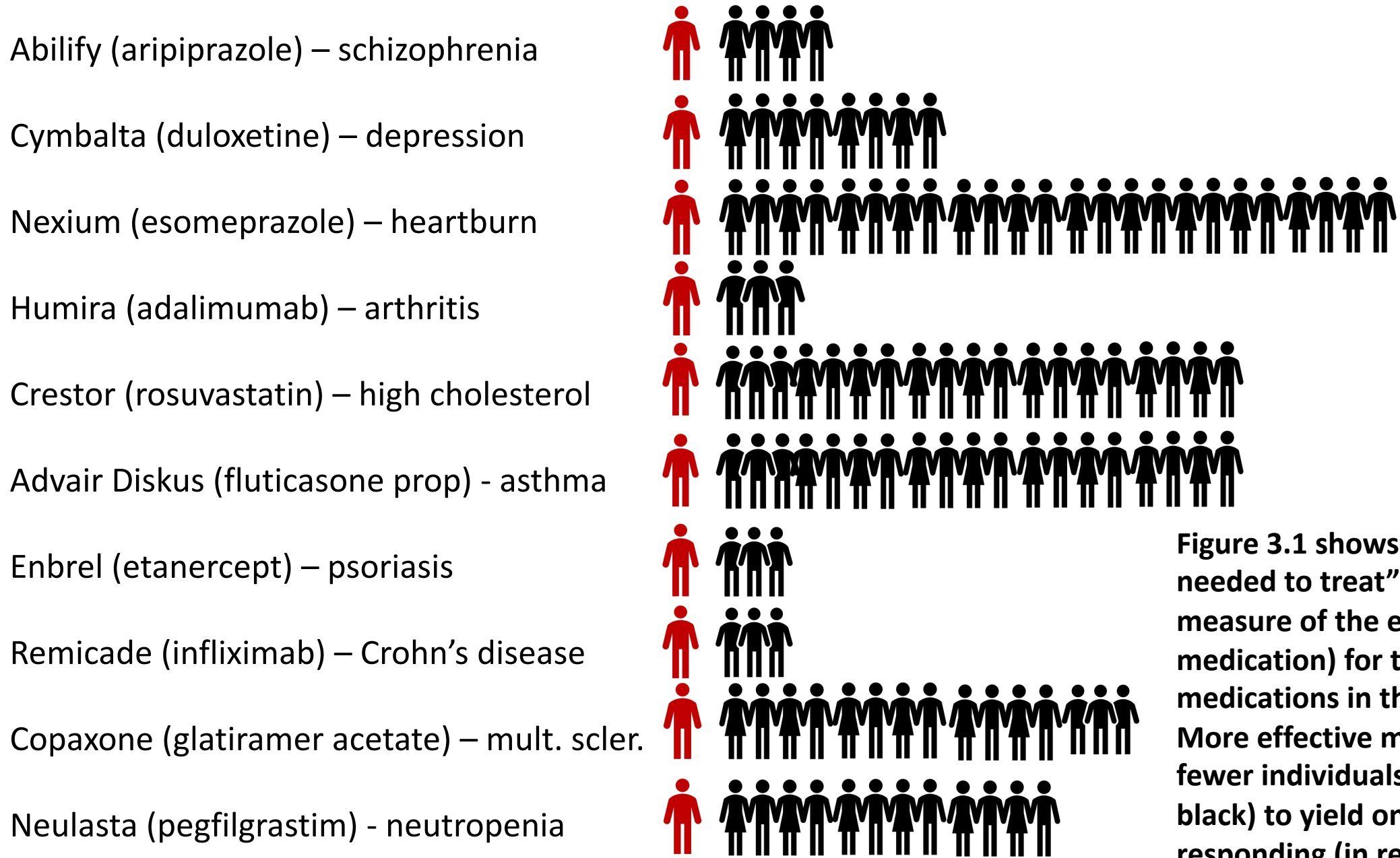
Healing Chapter Three: Treatments Work

Abilify (aripiprazole) – schizophrenia

Cymbalta (duloxetine) – depression

Nexium (esomeprazole) – heartburn

Humira (adalimumab) – arthritis

Crestor (rosuvastatin) – high cholesterol

Advair Diskus (fluticasone prop) - asthma

Enbrel (etanercept) – psoriasis

Remicade (infliximab) – Crohn's disease

Copaxone (glatiramer acetate) – mult. scler.

Neulasta (pegfilgrastim) - neutropenia

Figure 3.1 shows "number needed to treat" (a statistical measure of the effectiveness of a medication) for the 10 top-selling medications in the U.S. (in 2015). More effective medications need fewer individuals treated (in black) to yield one person responding (in red). Data from N. J. Shork, Nature, April 30, 2015

Psychological Interventions Recommended by the WHO

Example of Intervention	Recommended for
Behavioral Activation	DEP
Relaxation Training	DEP
Problem Solving Treatment	DEP
Cognitive Behavioral Therapy (CBT)	DEP, CMH, SUB, PSY
Contingency Management Therapy	SUB
Family Counseling or Therapy	PSY, SUB
Interpersonal Therapy (IPT)	DEP
Motivational Enhancement Therapy	SUB
Parent Skills Training	CMH

Figure 3.2 The World Health Organization (WHO) in their mhGAP Intervention Guide recommend several psychological interventions for scaling up in low and middle income countries. These are equally useful in the U.S. DEP (depression), CMH (child mental health), SUB (substance use disorder), PSY (psychotic disorders). This list is not comprehensive but it makes the point that there are several evidence-based psychological treatments.   https://www.who.int/publications/i/item/9789241549790

The Landscape of Interventions for Mental Illness

Medications	**Psychological Treatments**
Antipsychotics (>20)	Cognitive Behavior Therapy
Antidepressants (>30)	Problem Solving Therapy
Anxiolytics (>10)	Family Interventions
Mood Stabilizers (7)	Interpersonal Therapy
ADHD meds (6)	Behavioral Activation
Neuromod. Treatments	**Rehabilitative Interventions**
Transcranial Mag. Stim. (TMS)*	Assertive Community Treatment
Electroconvulsive Rx (ECT)*	Supp. Employment/Academics
Deep Brain Stimulation (DBS)	Supportive Housing
Transcran. Dir. Curr. Stim. (DCS)	Family Psychoeducation
Vagal Nerve Stimulation (VNS)*	Clubhouse

Figure 3.3 There is a wide range of effective treatments available for mental illness. This list is not comprehensive but it makes the point that research has documented an abundance of treatments with efficacy and effectiveness. Unfortunately, these treatments are rarely given early, adequately, or in combination. For neuromodulatory treatments, * represents FDA approval.

Healing Chapter Four: Fixing Crisis Care

U.S. Capacity for Inpatient Care of People with Mental Illness

Facility	# Beds	% Total Beds	#/100,000
State and County Psychiatric Hospitals	39,907	23%	12.6
Private Psychiatric Hospitals	28,461	17%	9
General Hospital with Psychiatric Unit	31,453	18%	9.9
VA Medical Centers	7,010	4%	2.2
Residential Treatment Centers	42,930	25%	13.5
Other Specialty Inpt/Res Providers	20,439	12%	6.4
Total	170,200	100%	53.6

Table 4-1. The Number of Inpatients in hospital and residential care in the US in 2014.
Data from Trends in Psychiatric Inpatient Capacity, United States and Each State, 1970 – 2014, National Association of State Mental Health Program Directors.
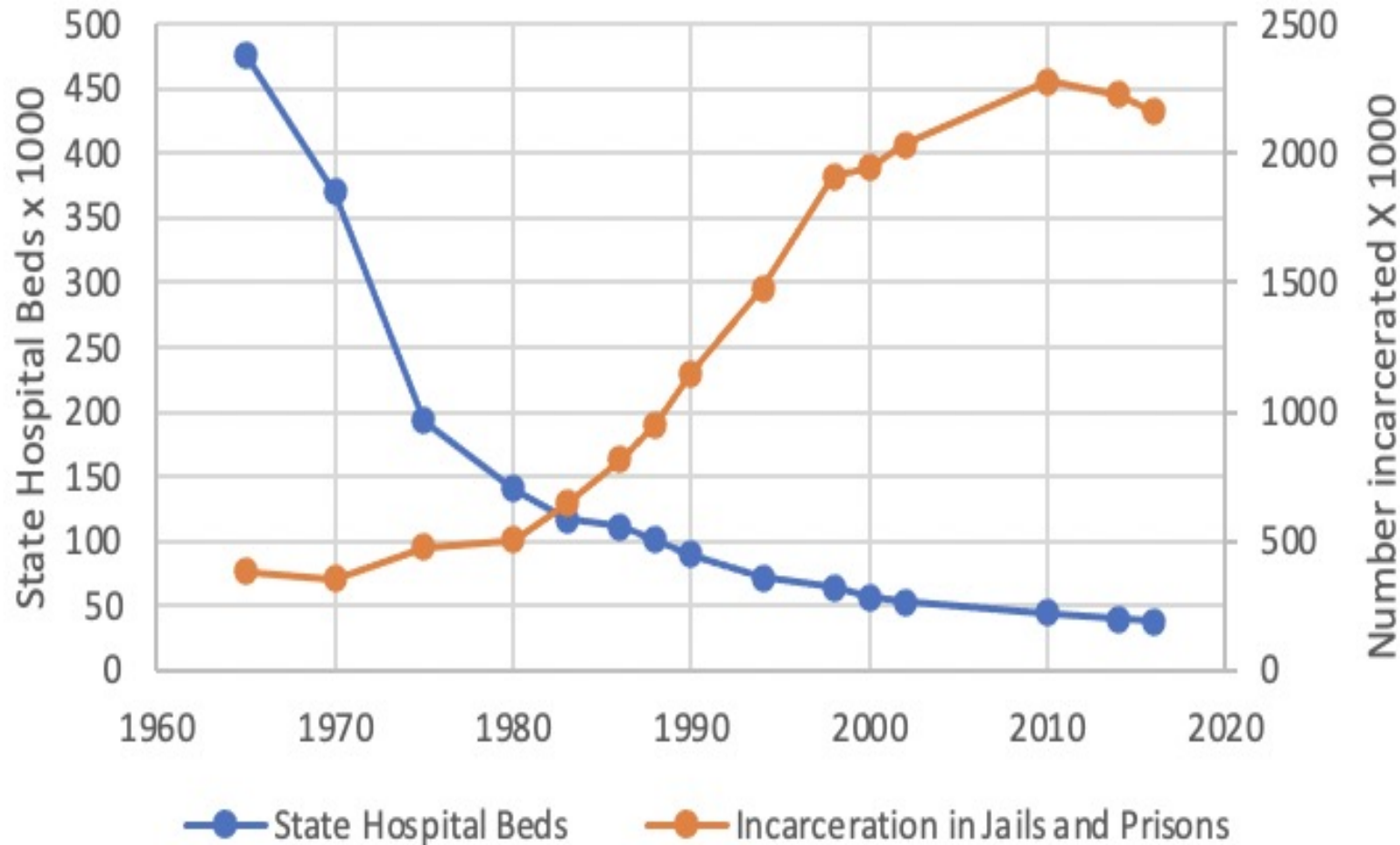
Figure 4.1 Trends in number of state hospital beds versus number of individuals in jails and prisons from 1965– 2016 in the U.S. Data for state hospital beds from the National Association of State Mental Health Program Directors. Data for incarceration from Bureau of Justice Statistics includes state and federal jails and prisons. Note incarceration numbers for 1965– 1975 are estimates based on historical rates for jail incarceration, as BJS data prior to 1980 were for prisons only.
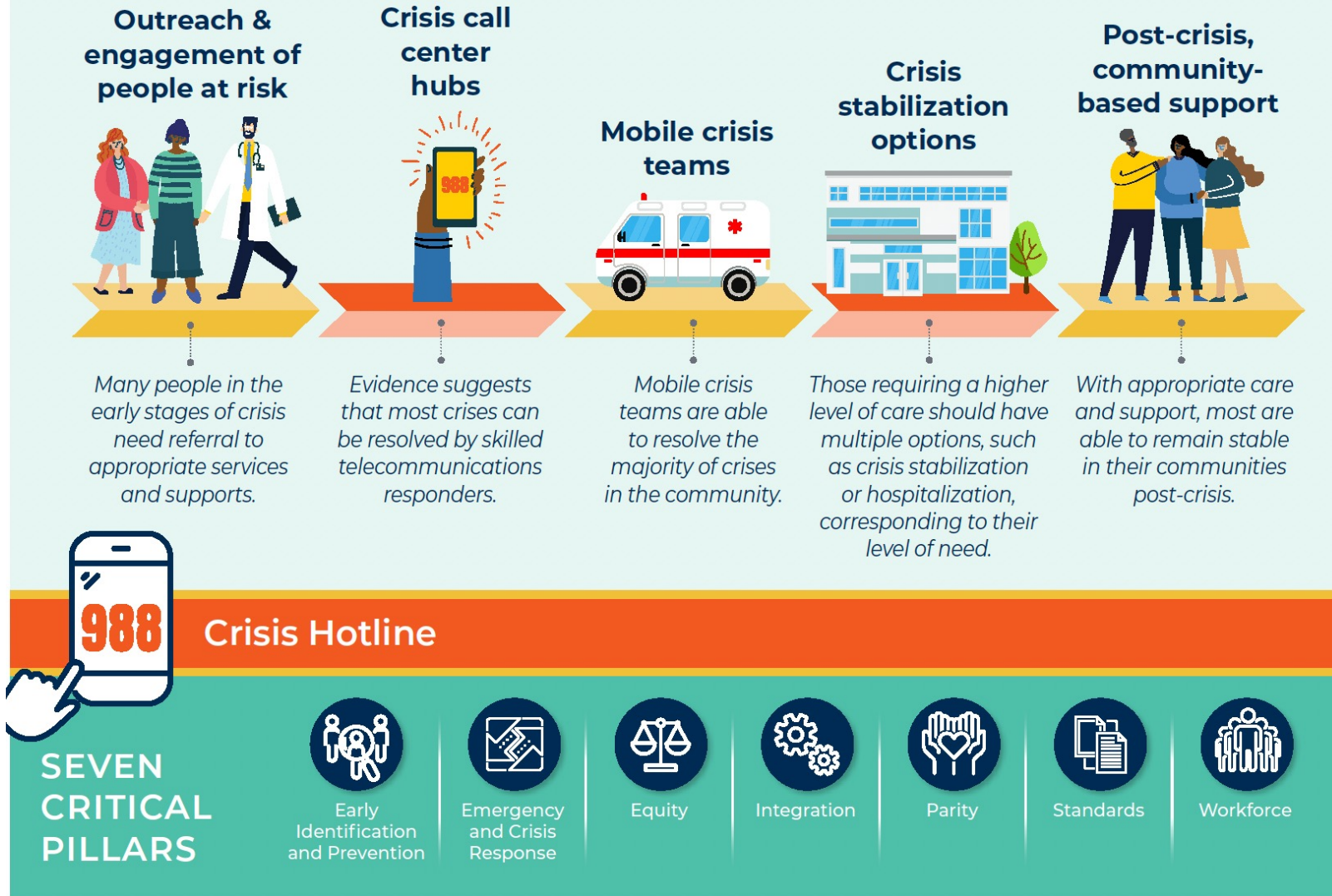
Figure 4.2 Transforming crisis care will begin with a new crisis response line – 988. Beyond this new number to call, transformed crisis care requires someone to come and someplace to go. Figure from https://wellbeingtrust.org/wp-content/uploads/2021/11/988-Crisis-Response-Report-November-FINAL.pdf

Healing Chapter Five: Crossing the Quality Chasm

The U.S. Mental Health Workforce

Clinical Title	Degree	Supervised Trng	Number/US	Number/100K
Psychiatrists	MD	4 yrs residency	33,650	10.3
Child Psychiatrists	MD	6 yrs residency	8,090	2.5
Psychologists	PhD/PsyD	2 yrs (1 post grad)	91,440	28.1
Lic. Clin. Soc. Workers	MSW/PhD	2 yrs	239,410	73.6
Psych Nurse Pract.	RN/MA/PhD	Not specified	10,450	3.2
Marr. Fam. Therapists	MA/PhD	2 yrs	53,080	16.3
Lic. MH Counselors	MA/PhD	2 yrs	140,760	43.3
School Counselors	BA	Varies by state	116,080	35.6
Total			692,960	213.2

Table 5.1 The U.S. mental health workforce is vast and varied. *Data from HRSA Report, Dec 15, 2020.*
https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/bh-workforce-projections-fact-sheet.pdf

Is the Mental Health Workforce Trained to Provide the Treatments that Work?

A. Number of Practitioners in US

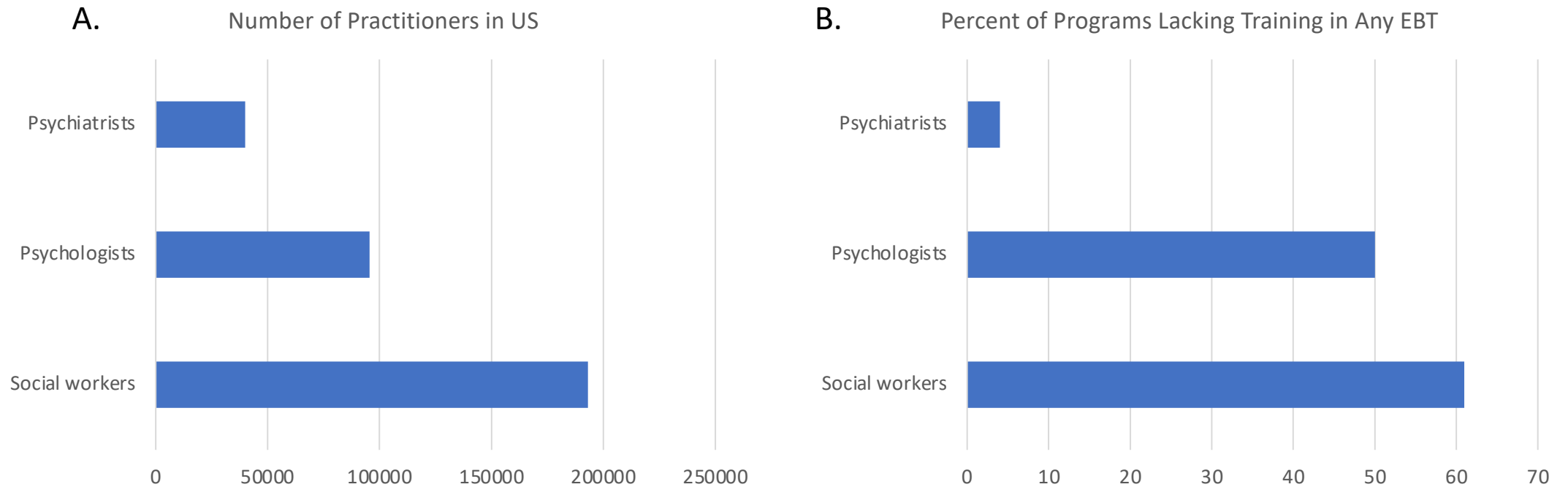B. Percent of Programs Lacking Training in Any EBT

Figure 5.1 (A) The number of practitioners for social work, psychology, and psychiatry in the US. estimated in 2006.   In (B) the percentage of programs for these practitioners lacking training in psychological therapies considered evidence-based treatments (EBT). (Data adapted from Weissman et al, Arch Gen Psych 2006)

Figure 5.2. Mental health vs cardiovascular quality scores 2005-2016. Data show percentage of population meeting quality standard for a mental health (MH) measure (outpatient follow-up within seven days of hospital discharge) compared to a cardiovascular (CV) measure (persistence of beta-blocker treatment for six months after hospitalization for a heart attack) in patients with private insurance, Medicaid, or Medicare. Improvements across time are evident in cardiovascular care but not psychiatric care.

Quality of Mental Health Care Based on HEDIS Measures - 2019

Topic	Measure	Performance Scores (2016)
Screening	**Depression screening and follow-up**	**NA**
Monitoring	PHQ-9 to monitor depression symptoms	NA
Medication Management	Adherence to antipsychotics	59.2
	Antidepressant medication management	53.1 (3 mos.); 38.0 (6 mos.)
Psychosocial Care	Use of first-line psychosocial care for children and adolescents on antipsychotics	60.2
Care Coordination	Follow up after emergency department care	39.5 (30 days)
	Follow up after hospital discharge	45.5 (7 days); 63.8 (30 days)
	Follow up care - children on ADHD meds	ADHD: 44.5 (1 visit/30 days); 54.5 (2 visits/9 mos.)
Overuse	Multiple antipsychotics in children/adolescents	2.4
Integration with Medical Care	Diabetes screening for adults using antipsychotics	80.7
	Metabolic monitoring for children/adolescents on antipsychotics	33.3
Outcomes	Depression remission or response	NA

Figure 5-3. 2019 HEDIS Measures for Mental Health. Scores shown for Medicaid population from 2016 report card, the most recent performance data available. Range is 0 – 100. NA indicates "not available" data as measures added since 2016.

Healing Chapter Six: Precision Medicine

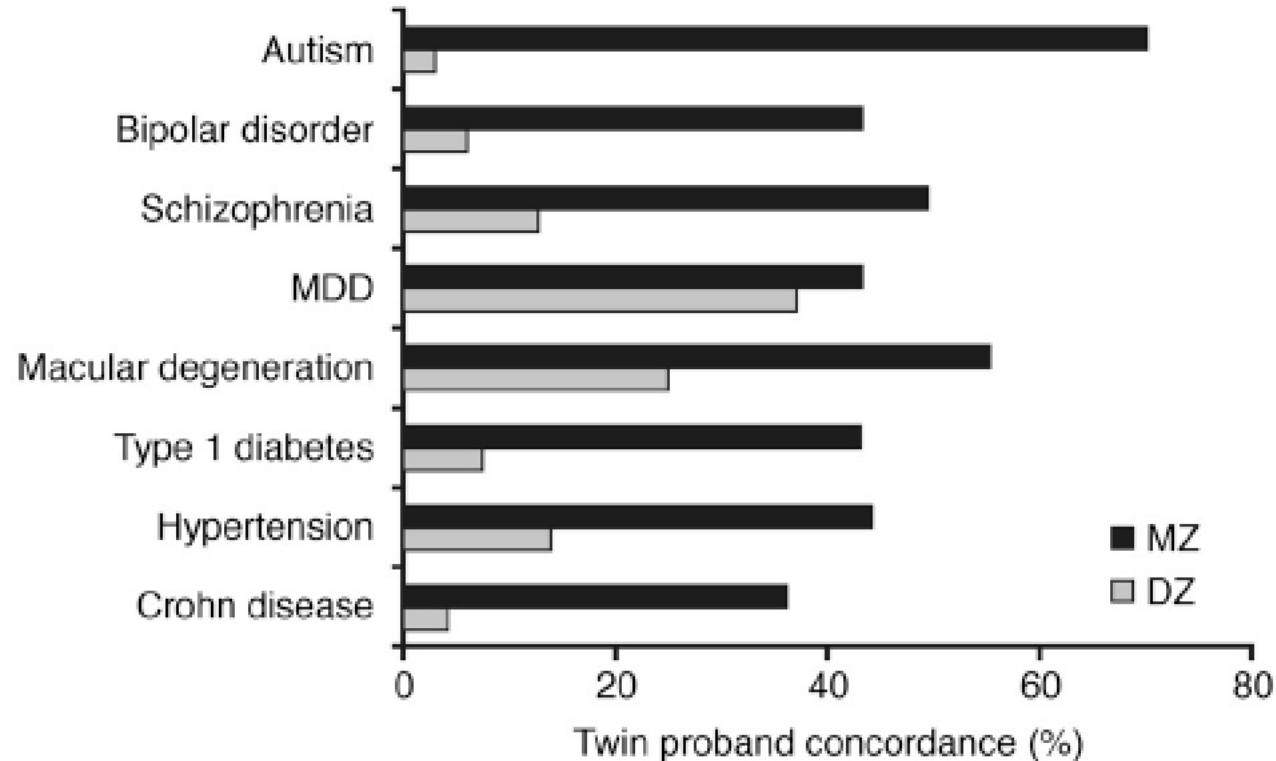# Heritability of Major Mental Illnesses

Figure 6.1 Heritability based on twin studies comparing concordance (ie. co-occurrence of diagnosis) in identical or monozygotic (MZ) and fraternal or dizygotic (DZ) twins. These results suggest the likelihood of finding genetic factors for autism, bipolar disorder, and schizophrenia but perhaps not MDD (major depressive disorder). Data from TR Insel, Journal Clinical Investigation, April, 2009. https://www.jci.org/articles/view/38832
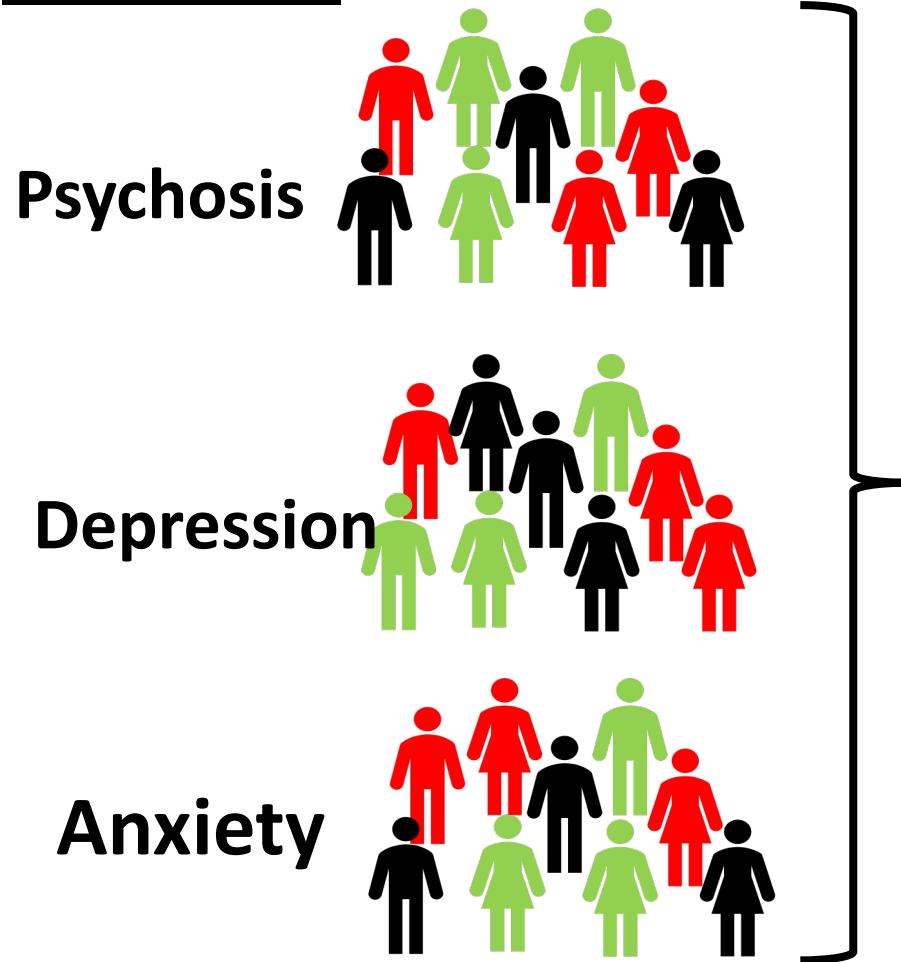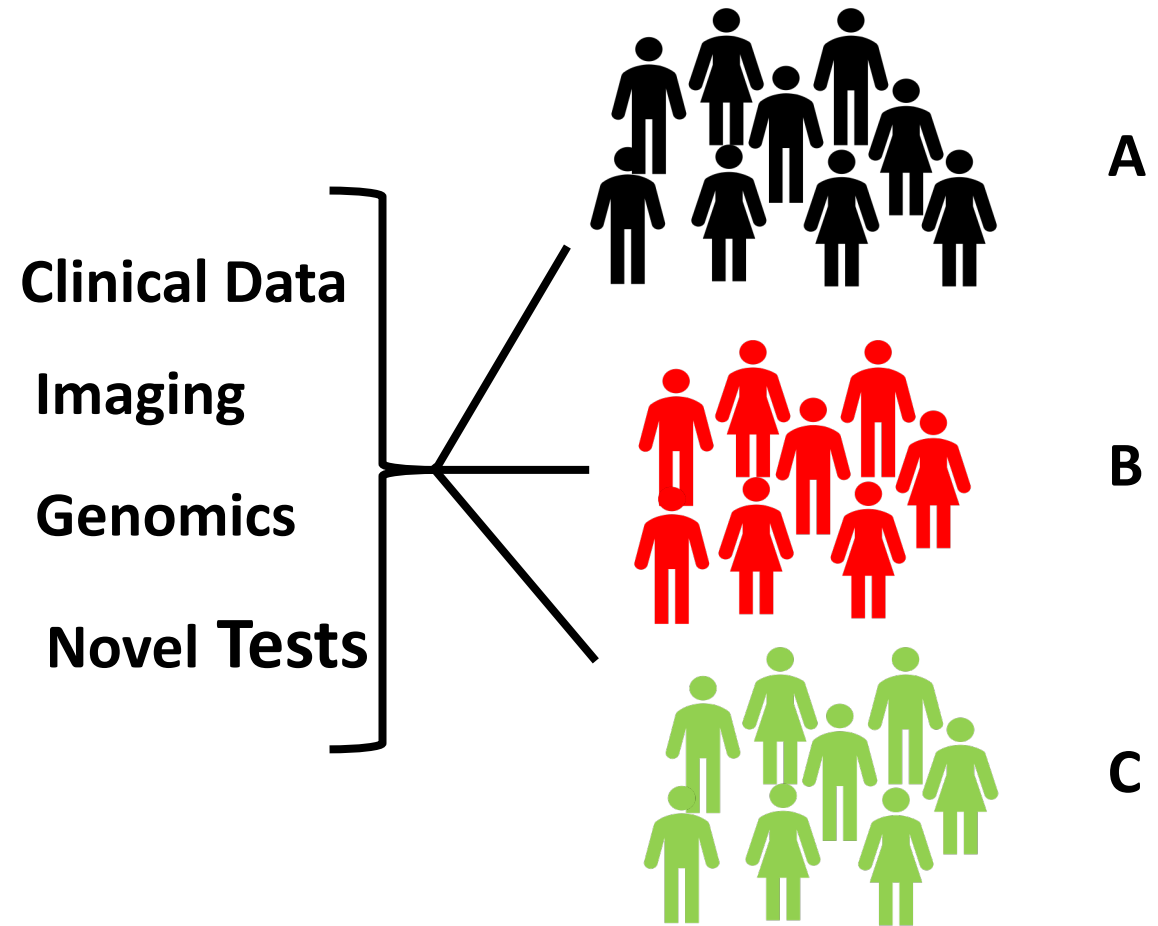
Figure 6.2 The vision for precision psychiatry deconstructs the current heterogeneous diagnostic categories to create more homogeneous groups that match with treatments, ensuring more personalized and effective care.

Healing Chapter Eight: Recovery

Figure 8.1 The legend of Dymphna led to the church in her honor in Gheel, Belgium where an adult foster care system still thrives under the management of the Openbaar Psychiatrisch Zorgcentrum (OPZ), the local psychiatric hospital. Gheel welcomes people with serious mental illness and citizens provide housing in their homes, a service that some have called "CareBnB" (author's photo)

Fountain House

Figure 8.2 Fountain House in New York City is an intentional community that provides people, place, and purpose to members with serious mental illness in a setting that is both welcoming and elegant. Photo courtesy of Fountain House.

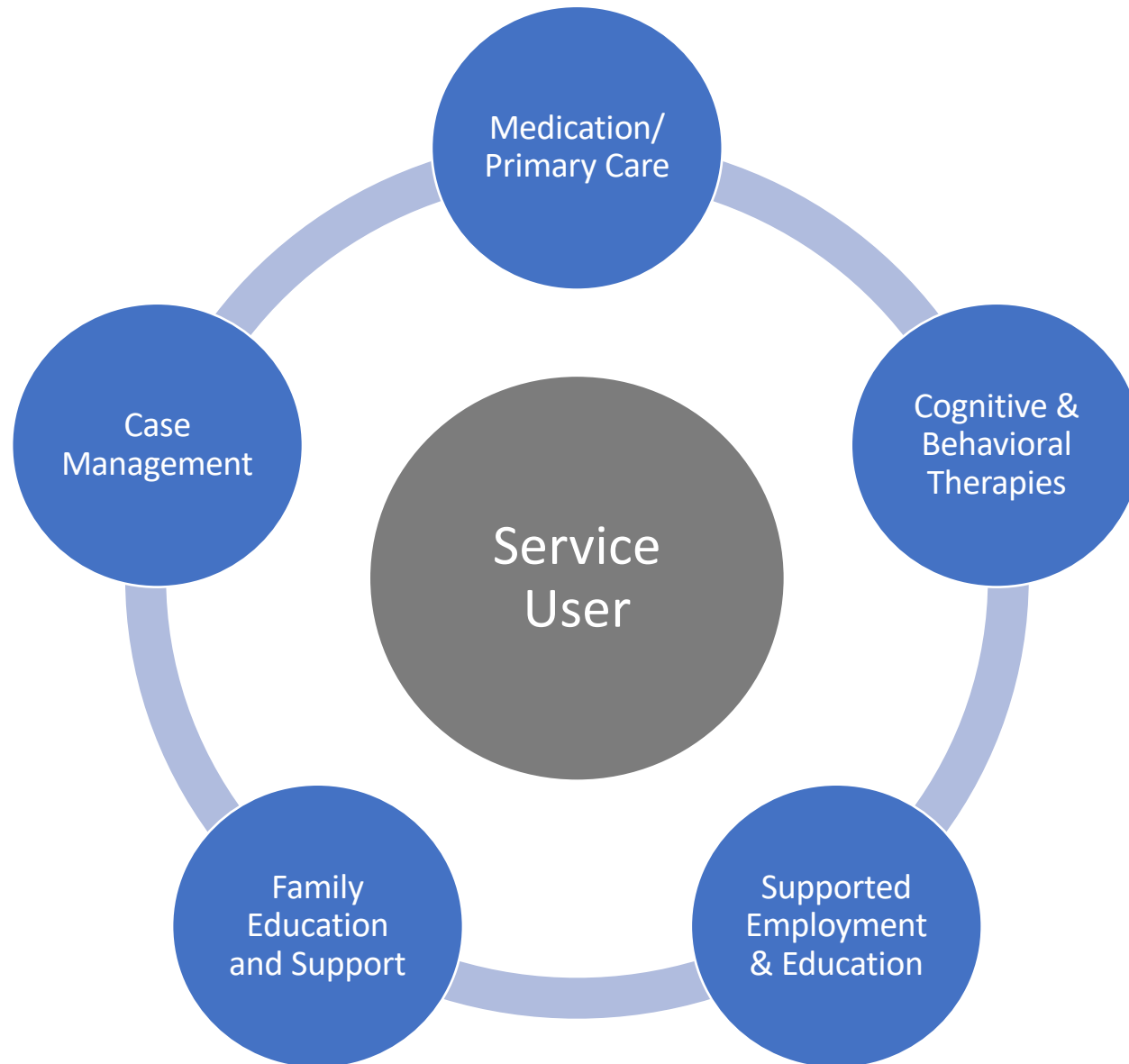# Healing Chapter Nine: Simpler Solutions

Coordinated Specialty Care

Figure 9.1 Coordinated Specialty Care (CSC) is a service package for people experiencing a first episode of psychosis. Rather than assuming that a single intervention will suffice, CSC provides an array of services to ensure recovery and prevent relapsed. An important part of the model is shared decision making with the service user. And results have been best when the program is continued for at least a year. https://www.nimh.nih.gov/health/topics/schizophrenia/raise/what-is-coordinated-specialty-care-csc

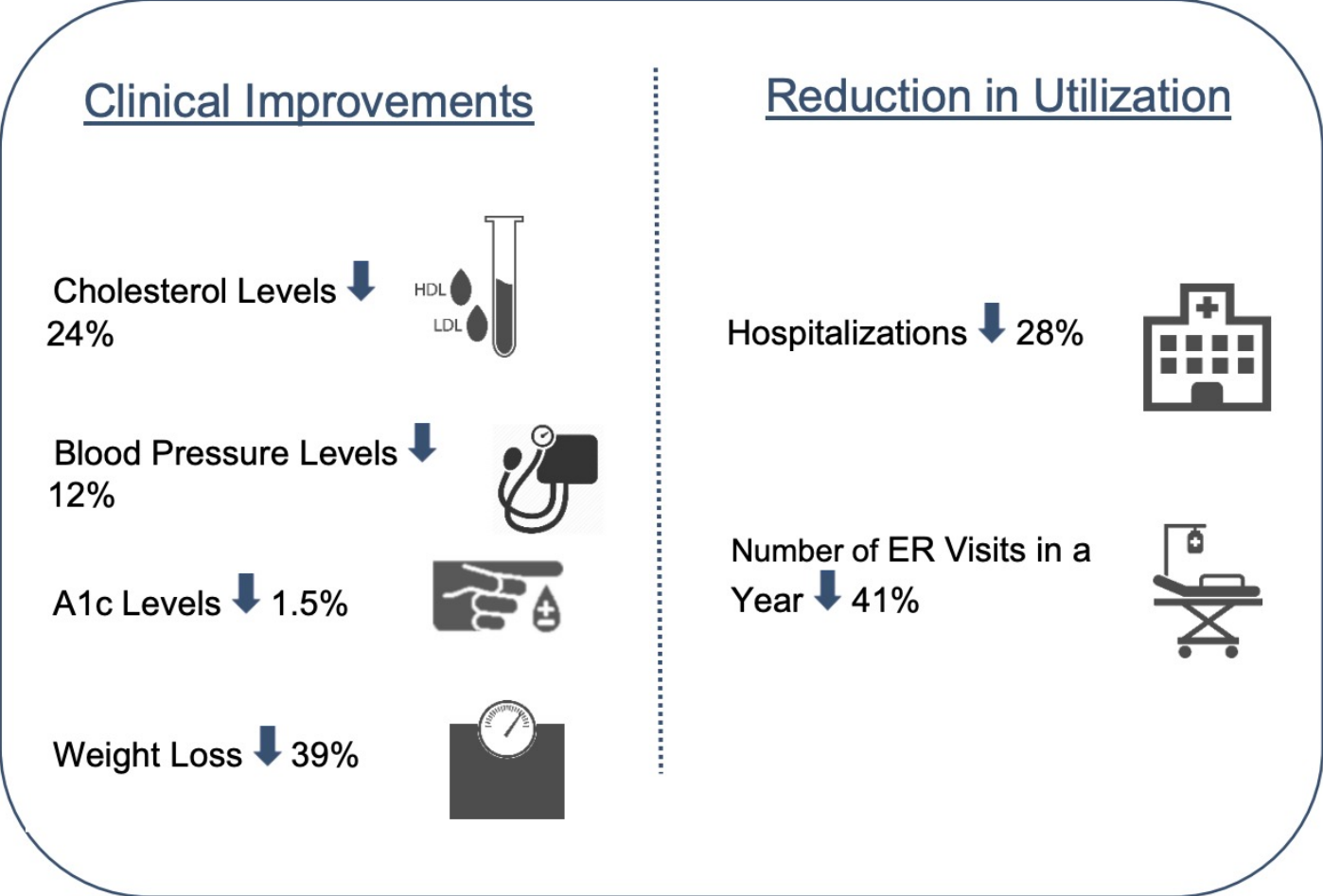# Impact of Missouri Health Home on Medical Status of Patients with SMI

Clinical Improvements

Cholesterol Levels ↓ 24%   HDL   LDL

Blood Pressure Levels ↓ 12%

A1c Levels ↓ 1.5%

Weight Loss ↓ 39%

Reduction in Utilization

Hospitalizations ↓ 28%

Number of ER Visits in a Year ↓ 41%

Figure 9.2 Health Home impact on medical outcomes in people with SMI.

https://dmh.mo.gov/sites/dmh/files/media/pdf/2019/10/2018%20HCH%20Annual%20Report.pdf

Certified Community Behavioral Health Centers

Status of Participation in the CCBHC Model

Legend:
- States where clinics have received expansion grants
- States selected for the CCBHC demonstration
- Independent statewide implementation
- No CCBHCs
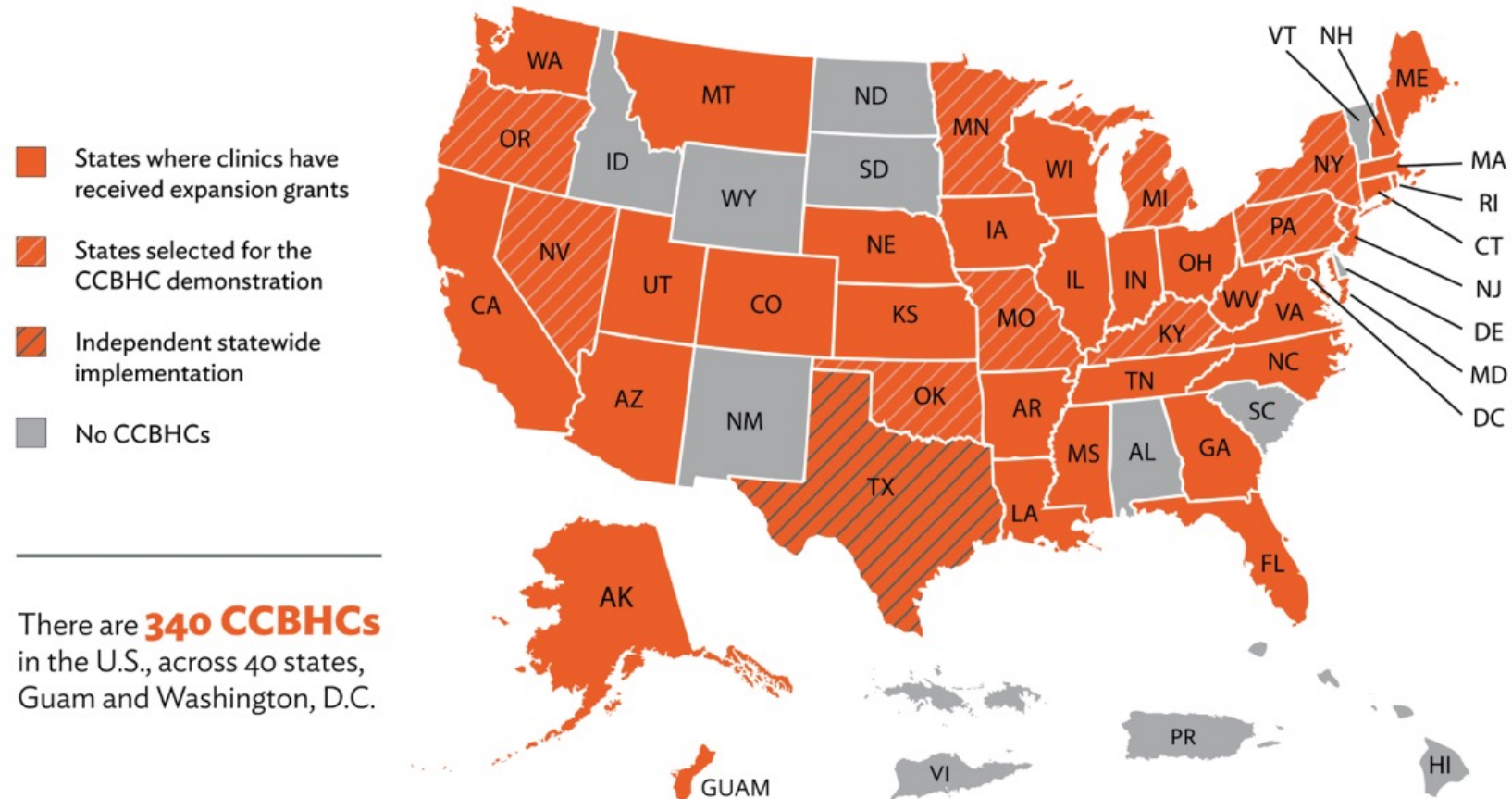
There are **340 CCBHCs** in the U.S., across 40 states, Guam and Washington, D.C.

Figure 9-3. As of May 2021, there were 340 CCBHCs across 40 states. This model provides comprehensive "whole person care" that in many states is supported via an alternative payment model.

https://www.thenationalcouncil.org/wp-content/uploads/2021/05/052421_CCBHC_ImpactReport_DataHighlights_2021.pdf?daf=375ateTbd56
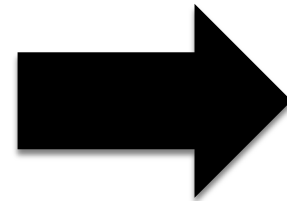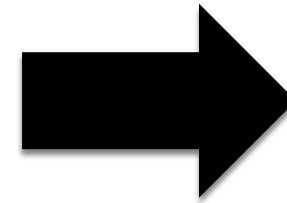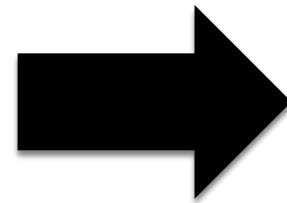
Healing Chapter Ten: Innovation

Technology Solutions for Mental Health Care

Problems

Solutions

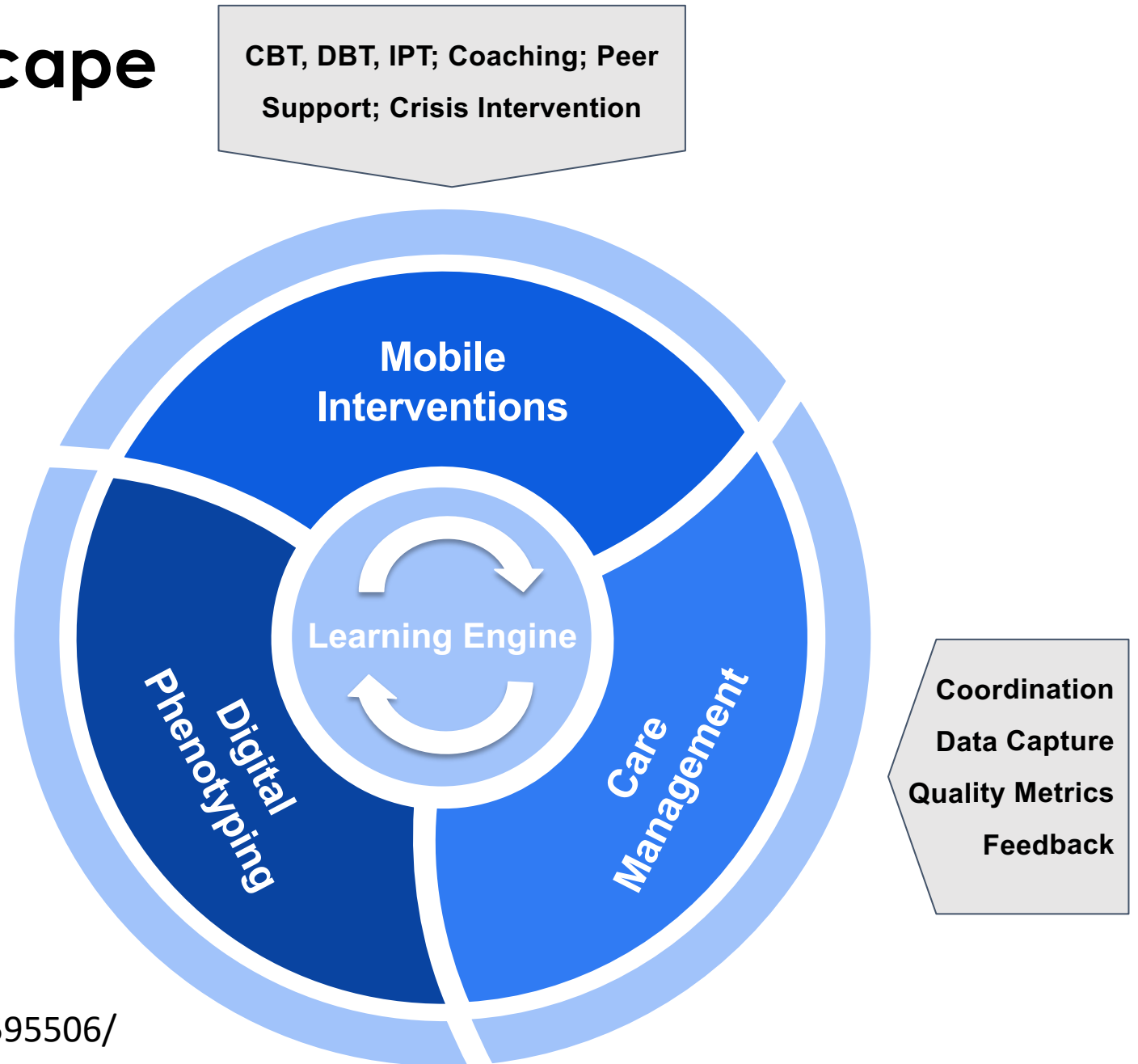| Problems	Solutions
Lack of Engagement	Person-centered online care
Lack of Quality	Training, Coordinated, connected care
Lack of Accountability	Measurement and Value Based Care

Figure 10.1 Technology, especially social media, has been viewed as part of the problem but can also be part of the solution. Three of the major problems in mental health care can be solved by innovative tools.

The Digital Health Landscape

Figure 10.2 The promise of digital innovation for mental health care is not an app or a point solution. It will be the combination of tools to improve measurement, interventions, and care management that together can create a learning engine, where feedback from continuous measurement improves the interventions that feeds into better care.

See TR Insel, Am J Public Health, 2019.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6595506/

CBT, DBT, IPT; Coaching; Peer Support; Crisis Intervention

Mobile Interventions

Learning Engine

Digital Phenotyping

Care Management

Sensors
HCI
Voice
Sociality

Coordination
Data Capture
Quality Metrics
Feedback

Healing Chapter Eleven: Prevention

Health ≠ Health Care

Figure 11.1 The DC Metro map provides a useful template for understanding health disparities. Sir Michael Marmot reminds us that the 17 mile journey from inner-city Washington DC to suburban Maryland (shaded area) is associated with a 20 year increase in longevity. This cannot be explained simply by better health care. Treatment with statins, one of our most powerful preventive interventions, increases longevity by 12.6 days. (Hansen et al, J Gen Intern Med, 2019)

Health ≠ Healthcare

10% related to clinical care

US annual = $3.2T

DETERMINANTS OF HEALTH
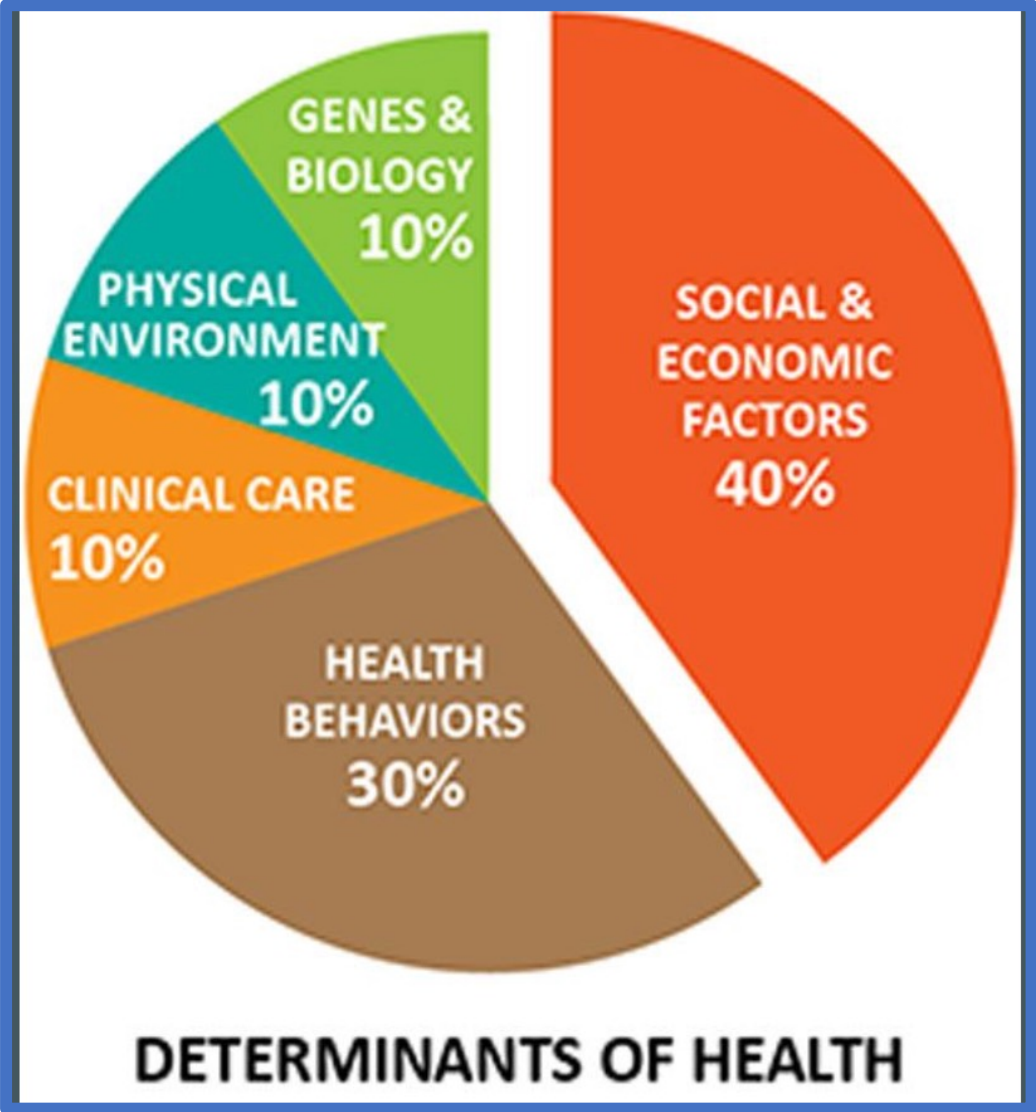
70% related to social factors and health behaviors

US annual = ?

Figure 11.2 Explaining the variance in health outcomes is difficult. Social, economic, and behavioral factors appear more significant than clinical care. Our current expenditures overvalue clinical care and undervalue other factors.

Source: WHO

Prevention in Mental Health

Tertiary
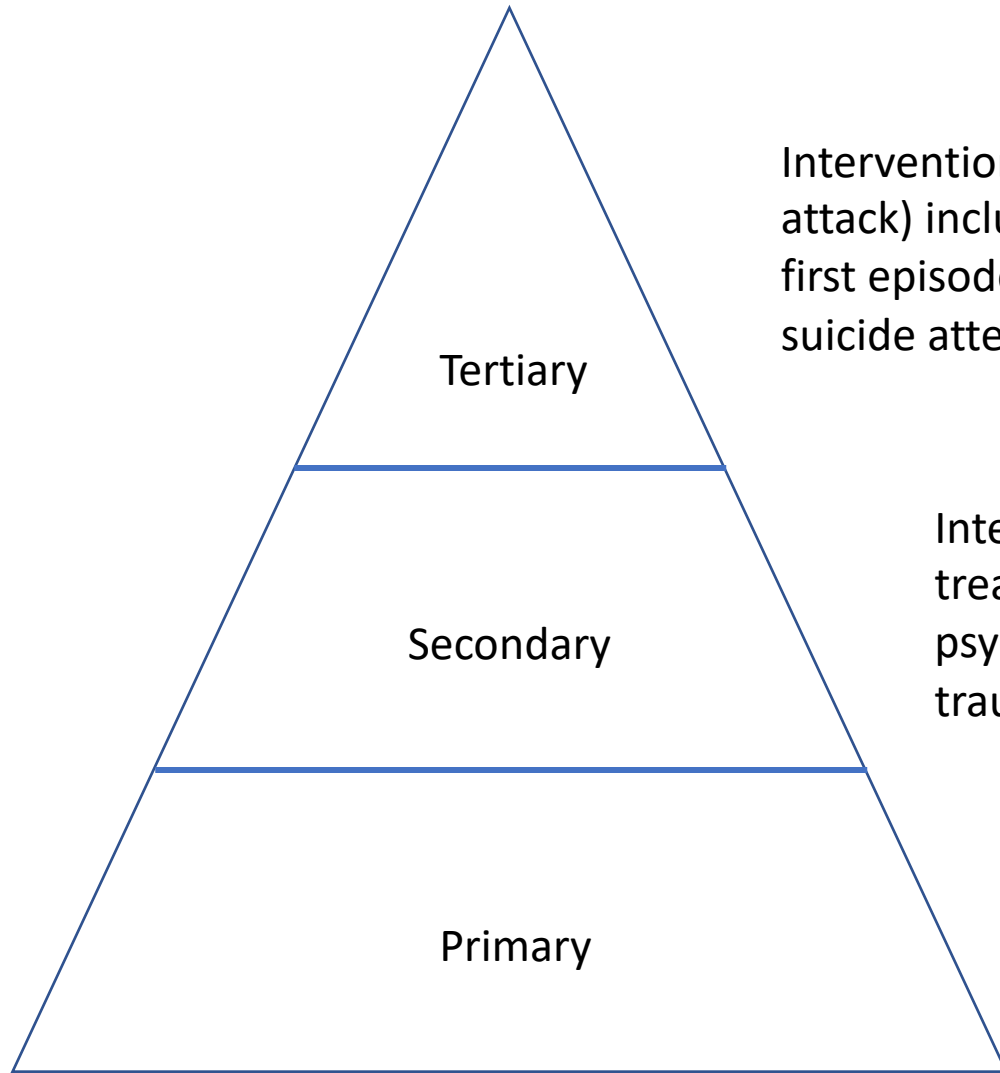
Interventions following onset (i.e., aspirin after a heart attack) include treatments to prevent relapse follpwing a first episode of psychosis or postvention following a suicide attempt.

Secondary

Interventions for people at risk (i.e., statins) include treatments to prevent depression in postpartum women, psychosis in prodromal youth, and PTSD following a traumatic event.

Primary

Universal interventions (i.e., vaccinations, seat belts) include policies that support families, increase firearm safety, educate children about social and emotional skills.

Figure 11.3 The three stages of prevention for mental health. Scientific research supports each of these as effective but these are under-utilized in a health care system focused on crisis services.