Mental Illness and Health Information Technology Use in the United States

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Background

- Health Information Technology (HIT) use has increased substantially over the past decade in the general population.

- Still, wider disparities exist in HIT usage based on sociodemographic characteristics
  (e.g. race/ethnicity, gender income, education, employment based differences).

- While most people with serious mental illnesses (SMI) are digitally connected (e.g. internet users), a few studies have examined HIT usage among individuals with SMI.

Knowledge Gaps

- First, the studies are often limited by the sociodemographic composition of participants or have small sample sizes due to convenience sampling
  (with biases inherent in such study designs; e.g. from healthcare facilities or clinics)

- Second, most larger studies published on the American population estimate SMIs or HIT use over a single year or for limited periods
  (i.e., one point in time, precluding trend analyses over a larger period).

- Third, the studies published often do not characterize those with SMIs or HIT users
  (e.g., prevalence based on race, gender, age, education, geography, marital status, occupation, etc.).

- Fourth, for those who use and do not use HIT based on the presence of SMIs, studies are limited by assessment of few measures of health and health outcomes
  (e.g., lack of a comprehensive delineation of health measures and disease burden, lifestyle behaviors, health outcomes, and healthcare utilization factors).

Purpose

Aim 1: Identify the extent of HIT use in adults with and without SMIs to understand the time trends of HIT use from 2011-2018.

Aim 2: Delineate the differences in HIT use by sociodemographic characteristics and SMI diagnosis.

Aim 3: Explore the association between HIT use, health outcomes, and health service utilization based on SMI diagnosis and sociodemographic characteristics from the NHIS 2011-2018.

Data

- The NHIS was designed by the U.S. Centers for Disease Control and Prevention and has been administered for the past six decades .
- The annual NHIS collects data on SMIs, HIT use, and 100+ other health and demographic variables for more than 30,000 households.
- Participants are sampled by households allowing for analysis of health behaviors at the family level while providing robust data on the health of American adults.
- Data are publicly available for individual NHIS years from the CDC website (merged for 2011-2018).

Measures

- ***Sociodemographic:*** Age group, gender, race, ethnicity, income, education, marital status, geographic location, veteran status, employment status, working schedule, household structure, family size, etc.
- ***Comorbidity Burden:*** Cardiovascular diseases (e.g., coronary artery disease, myocardial infarction, stroke, hypertension); Chronic respiratory diseases (e.g., asthma and COPD); Pain disorders (e.g., migraine, arthritis, and chronic back pain); Cancers (skin versus others such as breast, liver, and prostate); other chronic conditions (renal failure and other metabolic disorders, etc.).
- ***Healthcare Access and Utilization:*** Health insurance plans or healthcare payment sources, primary and emergency care access, number of healthcare visits (outpatient and emergency room), medical procedures and prescriptions received, skipping or delaying medical care, healthcare provider interactions, types of healthcare providers visited, nursing and home health services utilized, etc.
- ***Lifestyle and Behaviors:*** Smoking, tobacco use and quit attempts, alcohol use, physical activity and exercise behaviors, weight management, workplace exposures, sleep routine, complementary and alternative therapy use, health education, and health information sources and technology use.
- ***Health Status:*** General health, body mass index, past year work loss, emotional or physical disability, sensory/motor or social impairments, weakness and frailty, activities of daily living, and injuries, etc.

Measures

- ***HIT Usage:*** NHIS participants were asked if they scheduled appointments with healthcare providers, refilled prescriptions, or looked up health information by using the internet over the past year.

- ***SMI:*** Mental illnesses are ascertained in the NHIS by utilizing the participants' response to the Kessler-6 scale (score range 0=24 and SMI is score of ≥ 13)

Analysis

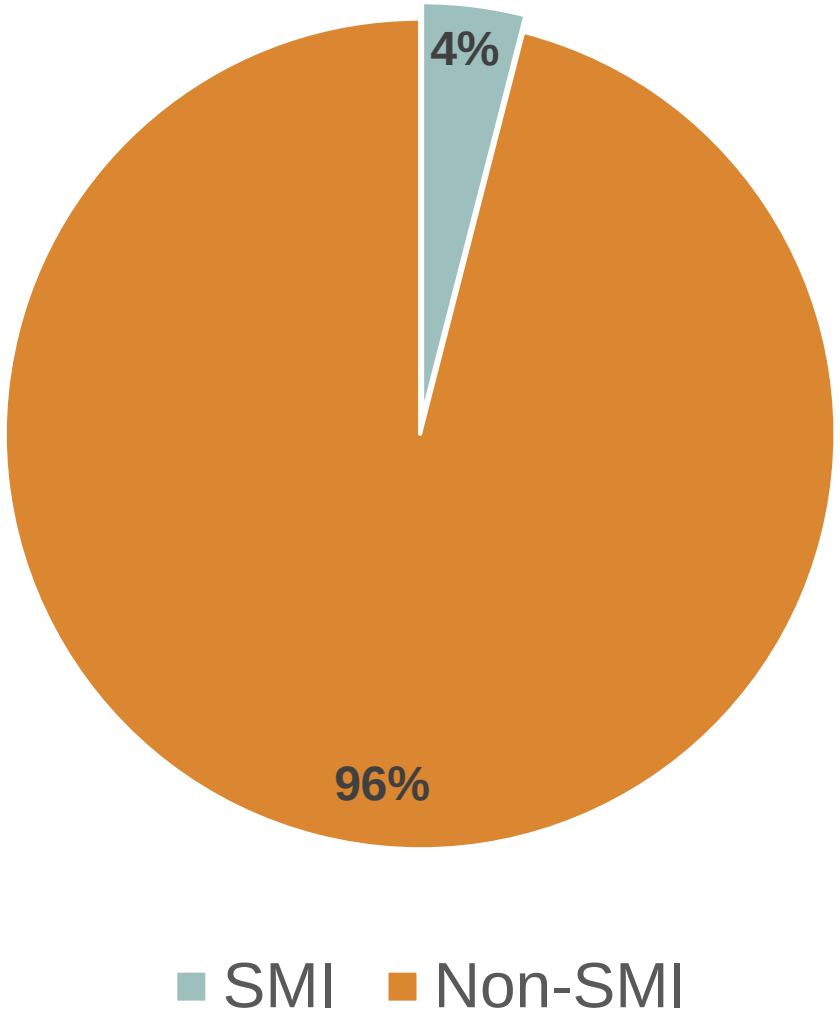
- The NHIS uses probability-based sample designs including clustering, stratified selection, and unequal weighting. These complex surveys comprise data that originate with sample designs that adjust for non-response and differing probabilities of selection.

- The study data were analyzed considering the complex sample design and weighting procedures to help reduce the standard errors, enhance precision, create larger samples of minority populations, and provide robust estimates for measures in group analyses.

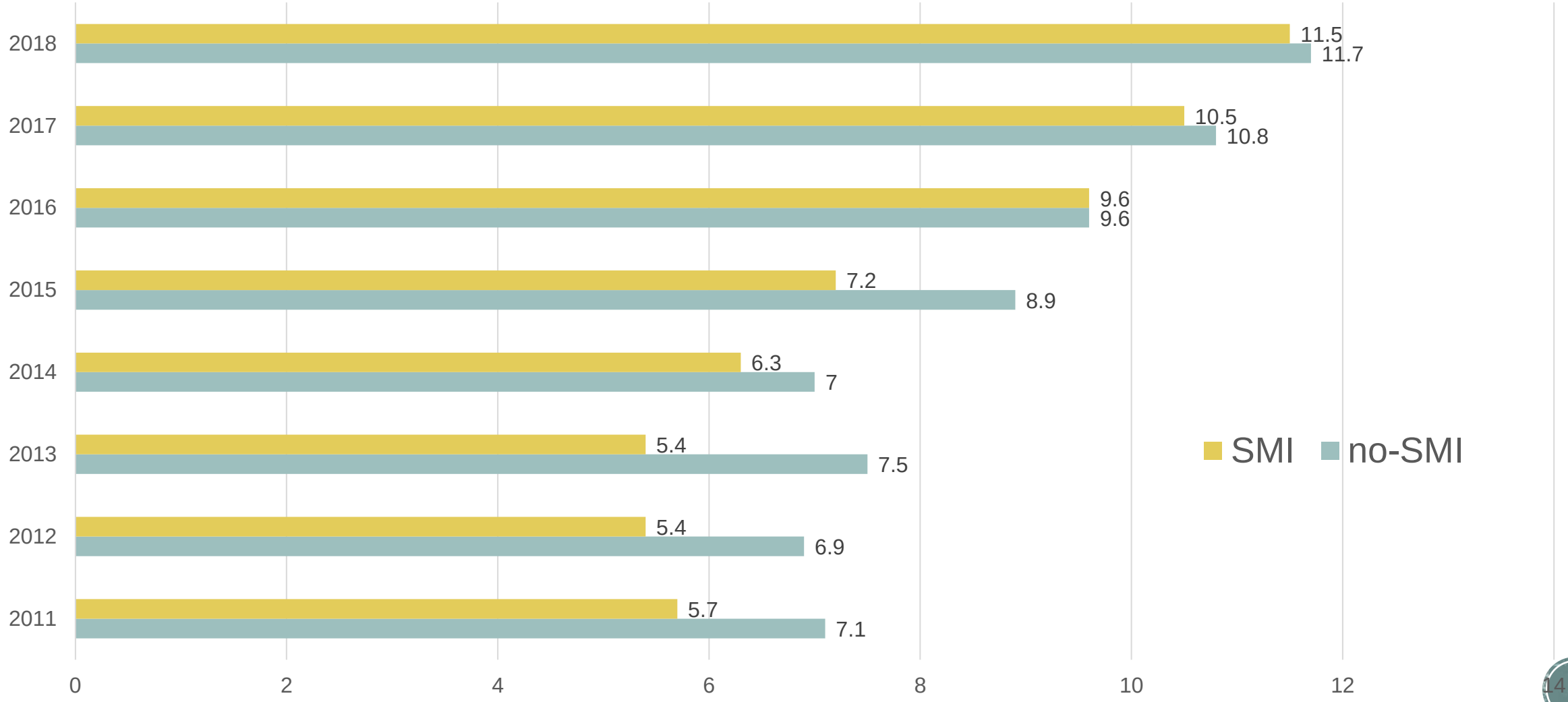
- Point estimates, corresponding variances (Taylor series linearization method), chi-square values, odds ratios, and 95% confidence intervals (CI) were be computed using the STATA 15 complex sample survey data analysis software.

Results

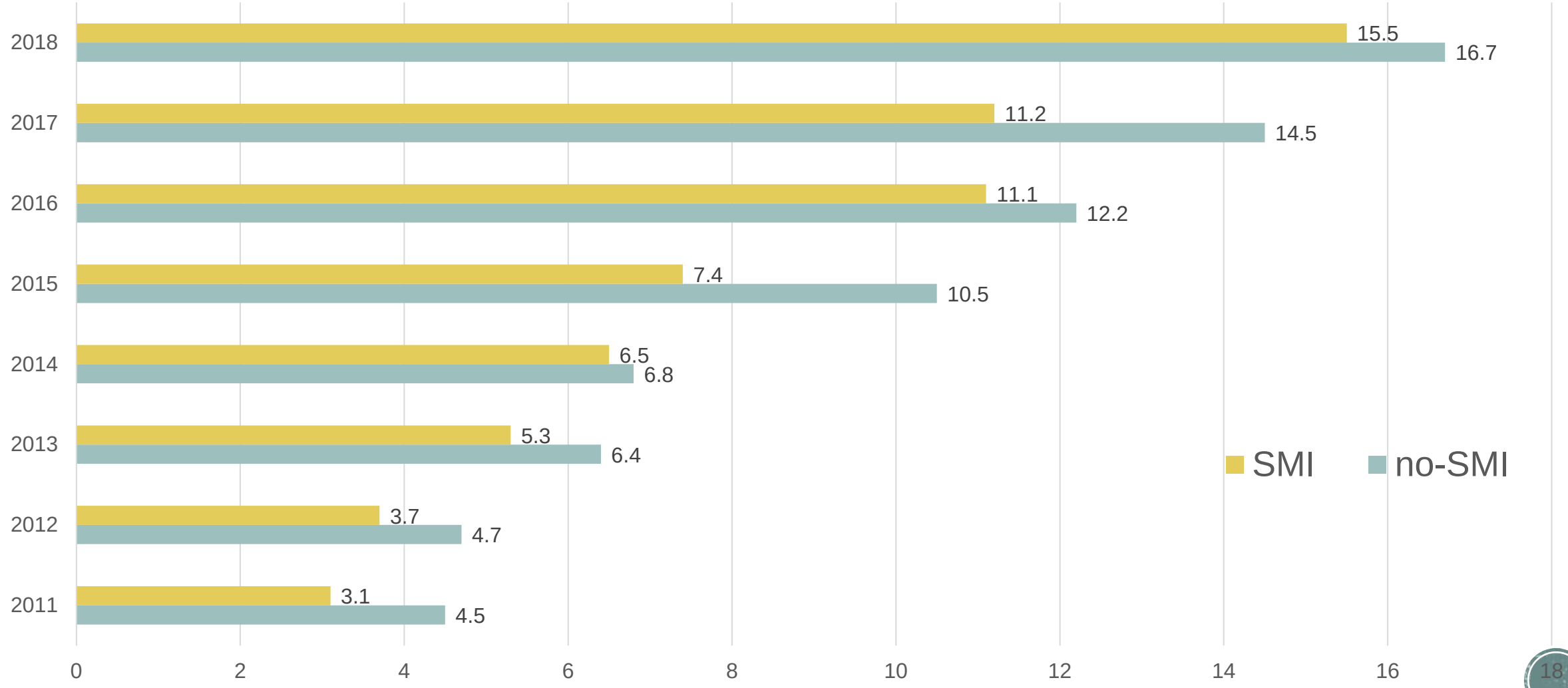
- Total Population= 249,390



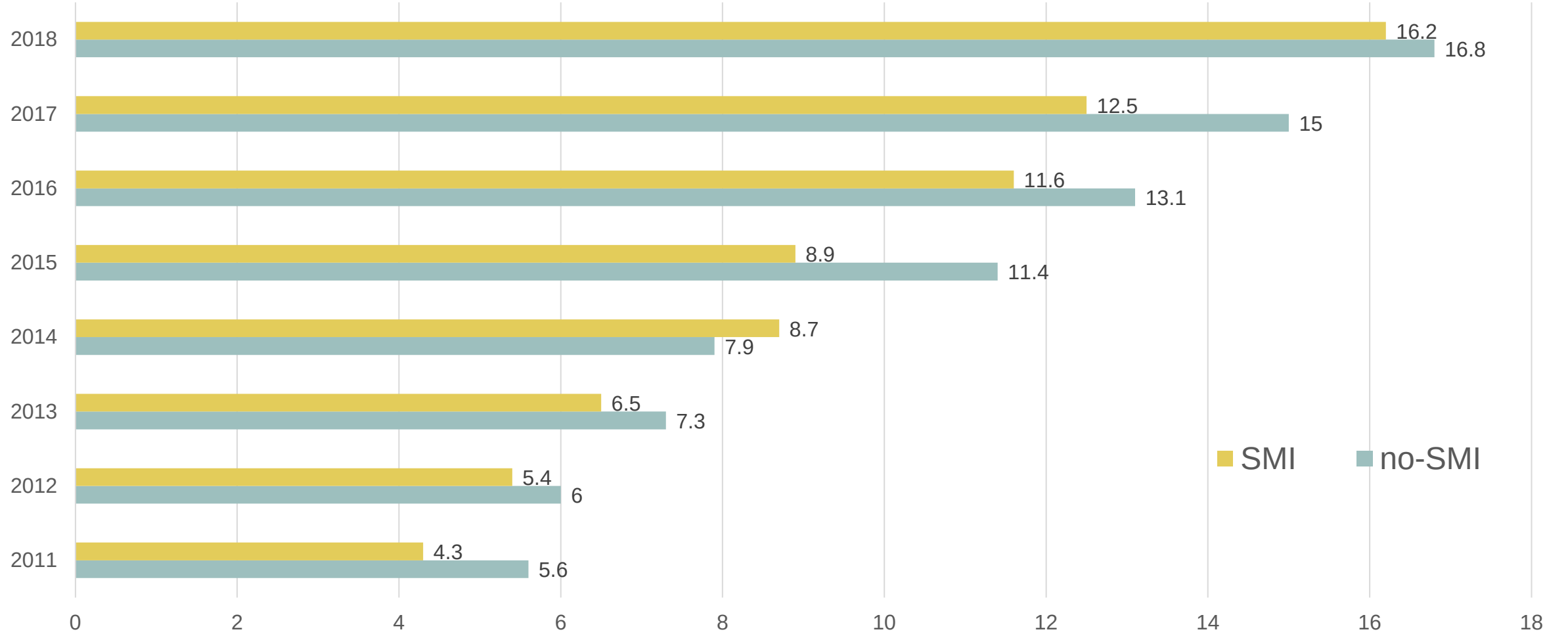
Refilled prescriptions on Internet (last year)



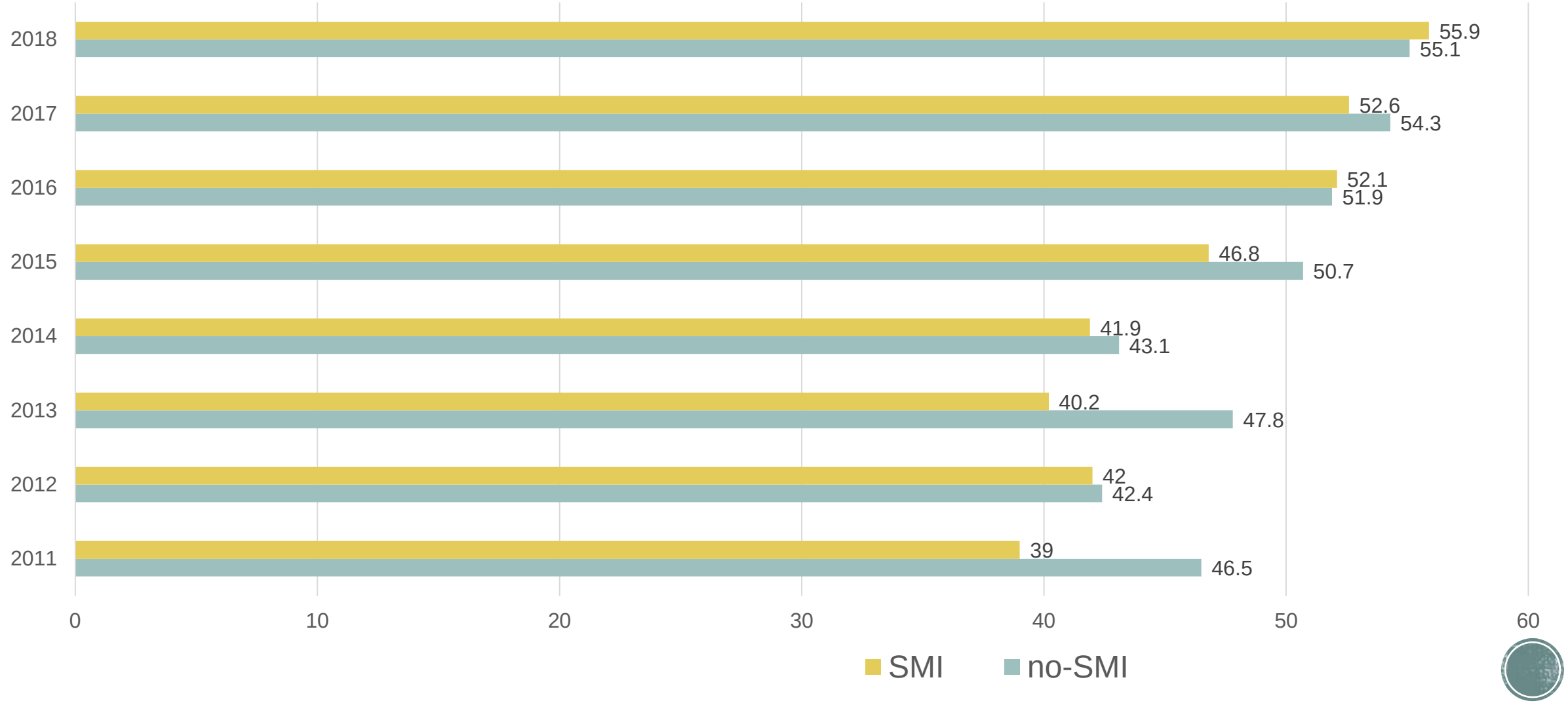
Scheduled appointment w health care provider on Internet (last year)



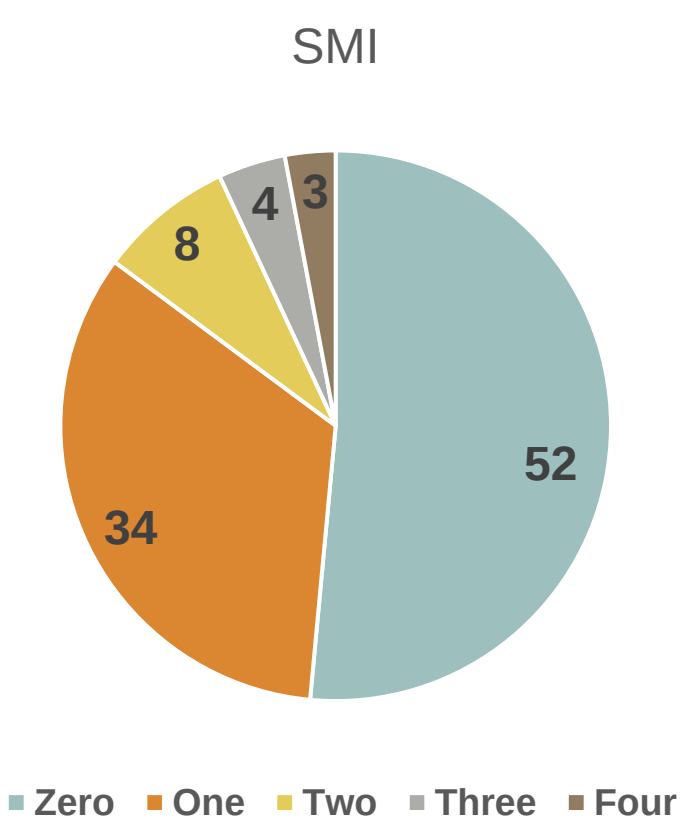
Communicated with healthcare provider using e-mail(last year)

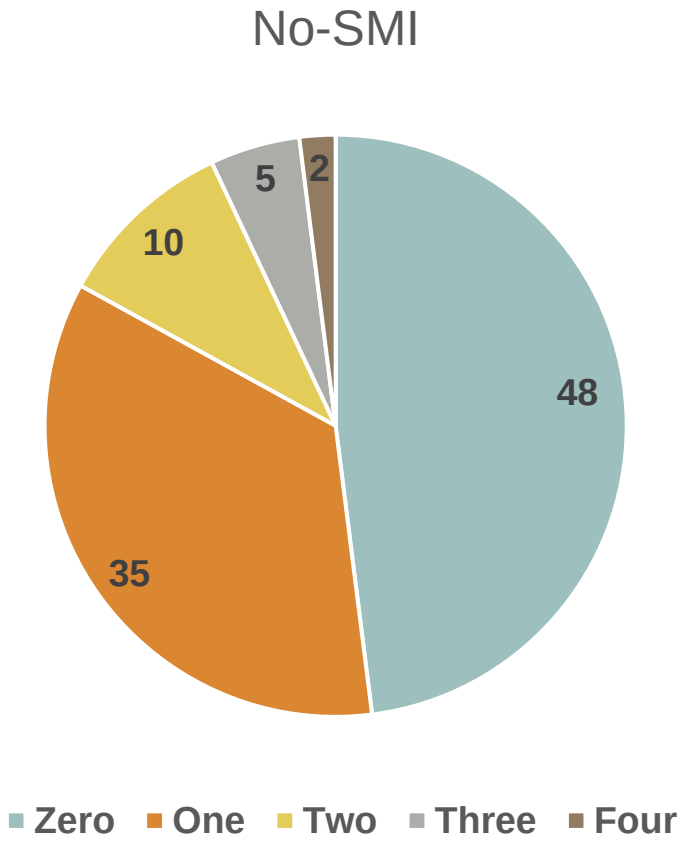


Looked up health information on Internet (last year)



HIT Use Score (0-4), [51% used HIT]





Individuals with SMI were 13% less likely to use any HIT from 2011-2018

Individuals with SMI- Models

- Odds Ratios with 95% CI computed
- Those with SMIs who were more likely to use any type of HIT were

Model 1	Model 2	Model 3= 2+1
Younger	Healthcare coverage	Younger/ Females
Non-Hispanic	No/ fewer chronic disease	White/ Non-Hispanic
Employed full-time	Get paid sick leave at work	Healthcare coverage
Females vs. males	Normal body mass index	Have >HS Diploma
Whites /Asians vs. others	Health =excellent/ very good	Fewer chronic diseases
Have > HS diploma	Lower activity limitations	Lower activity limitations
Earn >$59,999 per year	Fewer disability days/ ER visits	Fewer disability days/ ER visits

Conclusions

- HIT use has rapidly increased in the adult American population including those with SMIs
- Still, considerable disparities in HIT use exist between those with and without SMIs
- Within those with SMIs, racial/ethnic minorities, elderly, males, individuals with lower education or without healthcare coverage are less likely to use or be exposed to HIT.
- In those with SMIs, the usage of any type of HIT is related to health status and health outcomes. This relationship should be explored further to ascertain directionality.
- Given the growing burden of AMIs and SMIs, targeted interventions (i.e. education and policy) are needed to increase HIT exposure in these populations with healthcare needs.

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Баярлалаа
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