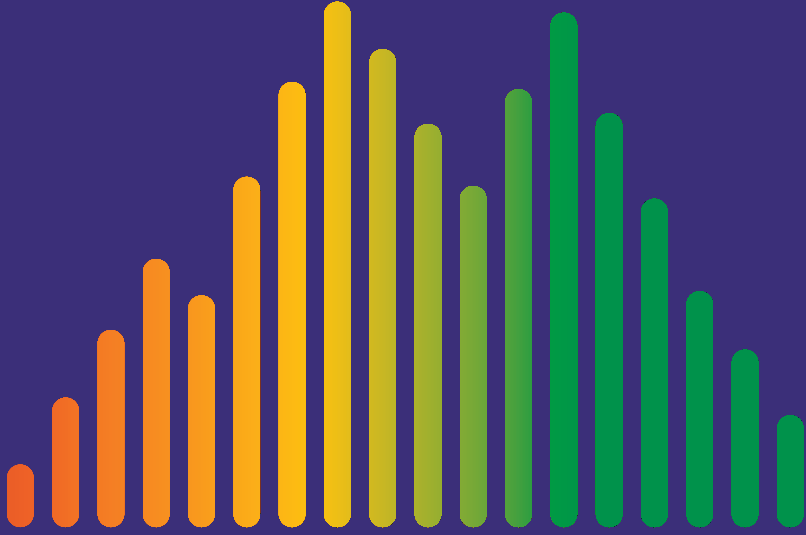**Sexual & Gender Minority Research**

PORTFOLIO ANALYSIS
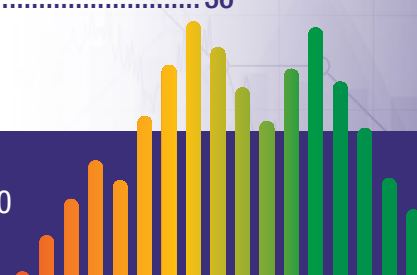
Fiscal Year 2020

NIH National Institutes of Health
Sexual & Gender Minority Research Office

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INTRODUCTION

The mission of the National Institutes of Health (NIH) is to seek fundamental knowledge about the nature and behavior of living systems and apply that knowledge to enhance health, lengthen life, and reduce illness and disability. As part of that mission, the NIH strives to support a range of biomedical, clinical, behavioral, and social sciences research to improve and protect the health of all sexual and gender minorities (SGM; please see NOT-OD-19-139 for more information) and has a specific interest in the disease areas and health conditions that most disparately affect these individuals. The populations that fall within the SGM portfolio at the NIH are defined as follows:

> *SGM populations include, but are not limited to, individuals who identify as lesbian, gay, bisexual, asexual, transgender, Two-Spirit, queer, and/or intersex. Individuals with same-sex or -gender attractions or behaviors and those with a difference in sex development are also included. These populations also encompass those who do not self-identify with one of these terms but whose sexual orientation, gender identity or expression, or reproductive development is characterized by non-binary constructs of sexual orientation, gender, and/or sex.*

The NIH Sexual & Gender Minority Research Office (SGMRO) coordinates SGM research and related activities by working directly with the NIH's 27 Institutes and Centers, as well as the Office of the Director (OD). The SGMRO also serves as a resource on SGM health and research for the NIH and extramural research and stakeholder communities. For this reason, the SGMRO is situated within the OD—the central Office responsible for setting policy for the NIH and for planning, managing, and coordinating the programs and activities of all NIH components—and resides more specifically within the Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI).

In 2015, the NIH developed the first agency-wide strategic plan devoted to advancing SGM health research and established the SGMRO to help eliminate barriers to conducting SGM-related research. In October 2016, the NIH designated sexual and gender minorities as a health disparity population for research at the NIH. This designation builds on previous steps taken by the NIH to advance SGM health research. The health disparity population designation marks an important and necessary step in realizing NIH's mission to advance the health of all Americans. The *NIH Strategic Plan to Advance Research on the Health and Well-being of Sexual & Gender Minorities: Fiscal Years 2021–2025* details SGM health- and research-related goals for the NIH through 2025.

This Fiscal Year (FY) 2020 Portfolio Analysis highlights the SGM-related research portfolio at the NIH and aims to both describe the full portfolio of SGM health research and provide insights into gaps and needs for additional SGM-related research. This analysis also serves as one way that the NIH tracks progress on the FYs 2021–2025 NIH SGM Health Research Strategic Plan.

METHODS

The projects included in the *NIH SGM Portfolio Analysis for FY 2020* are NIH-funded grants classified under the Sexual and Gender Minorities Research, Condition, and Disease Categorization (RCDC) spending category in the NIH RePORTER database. The Sexual and Gender Minorities category was added in FY 2015 to the official list of RCDC categories, which currently comprises more than 300 research areas, conditions, and diseases. Funding amounts derived from RCDC data are an estimate based on the SGM fingerprint, text-mining approach, and the grant funds attributed to projects in the category. The FY 2020 estimate of SGM projects and spending constitutes the sixth annual analysis to include those data. RCDC uses text data mining (i.e., categorizing and clustering words and multiword phrases) in conjunction with a description called a "fingerprint" consisting of more than 80 weighted concepts and synonyms selected by scientific experts at the NIH to define spending categories. It is important to note that some SGM health–related projects may not be captured if the specific language used in the fingerprint is not also used in the study application information.

Using this method, the SGM spending category may include projects that focus on a research area, disease, or condition that significantly affects SGM populations, such as discrimination or minority stress. Alternatively, a project may be incidentally related to SGM research, such as a study about mental health that includes SGM participants as a control or comparison. We generally use the terms *specific* and *relevant* to distinguish between these two broad categories. *Specific* refers to a project focused primarily on a pertinent disease, condition, or population; *relevant* means that a project pertains to a category, but another disease area, condition, population, or other focus is considered primary.

Using data downloaded from RePORTER for FY 2020, 502 projects were included in the SGM spending category. Two of these projects were removed because they were determined to not belong in the SGM portfolio. Data from the 500 remaining projects are the basis for all the analyses that appear in the first half of the report. Those counts of projects and dollar amounts for the analyses in Part One are all directly from the download in RePORTER.

By contrast, for Part Two of the FY 2020 Portfolio Analysis, each SGM-related project title, abstract, and specific aims section was reviewed and manually coded on the basis of the variables listed in Appendix I. The variables created during this curation process were chosen because they were noted as being of special interest to SGM health research by SGMRO staff, members of the SGM Research Coordinating Committee, and members of the SGM Research Working Group of the Council of Councils. Each of the three curators determined the presence or absence of these variables for those projects that were new for FY 2020. For projects where the coders did not initially agree, reconciliations were made by consensus during several virtual meetings. The curation results were compiled for FYs 2018, 2019, and 2020 to complete the FY 2020 curated analyses for the second half of the report. Finally, for the Relative Citation Ratio (RCR) analysis, only the NIH *iCite* tool was used.

2020 PORTFOLIO ANALYSIS

The total number of SGM projects has increased for six consecutive fiscal years.

SGM Project Increases

66.1%

FYs 2015–2020
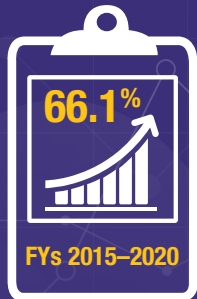
The **total number** of **projects** has **increased 66.1%** since 2015, from 301 to **500.**

Non-HIV/AIDS Funding

The **total number** of **non-HIV/AIDS** projects reached an all-time high in FY 2020.

DOUBLED

Training Awards

The **total number** of **training-** and **career-related awards** in **FY 2020 increased 89.8%** compared with **FY 2015.**

89.8%

Largest Populations Represented

Men who have sex with men (MSM), transgender individuals, and **bisexual** individuals are the **three largest** populations **indicated,**[1] accounting for **55.0%**, **21.9%**, and **17.2%** of the projects, respectively.

55.0% **21.9%** **17.2%**

MSM **Transgender** Bisexual
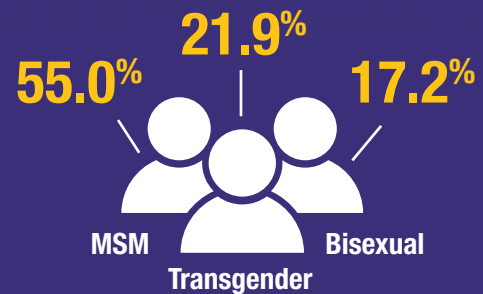
SGM-Categorized Projects

In **total, 5.9%** of all **SGM-categorized projects** pertain to **disorders or differences of sex development (DSD)** and **intersex** populations.

5.9%

DSD and Intersex

SGM Portfolio Project Increases

The **total number** of **projects at the NIH increased** from 51,382 in FY 2015 to **62,581** in FY 2020, an increase of **21.8%.** The **SGM portfolio,** by contrast, **increased** from 301 in FY 2015 to **500** in FY 2020, an increase of **66.1%.**

FYs 2015–2020
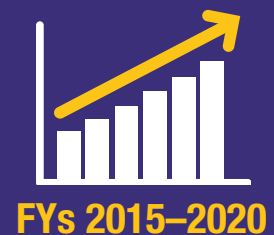
[1] As noted in the Methods section, project inclusion is based on both specific and relevant research, indicating the presence of an element of the project that pertains to the health of a given population; it does not necessarily mean that the project is primarily about that population.

Number of SGM-Related Projects, by NIH Institute, Center, or Office (ICO)

The 500 SGM projects at the NIH in FY 2020 were administered by 21 of the 24 grant-making components of the NIH. Approximately 61.2% of all projects (306 of 500), were administered by the National Institute of Mental Health (NIMH), the National Institute of Allergy and Infectious Diseases (NIAID), the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), and the National Institute on Drug Abuse (NIDA). This is a decrease from the 71.6% in FY 2018 and the 65.4% in FY 2019, indicating continued diversification across Institutes, Centers, and Offices (ICOs). The remaining 38.8% of projects were administered by 17 other ICOs in FY 2020. For a list of abbreviations for all NIH ICOs, see Appendix II.

Figure 1. FY 2020, Number of SGM-Related Projects, by NIH ICO (*N* = 500)
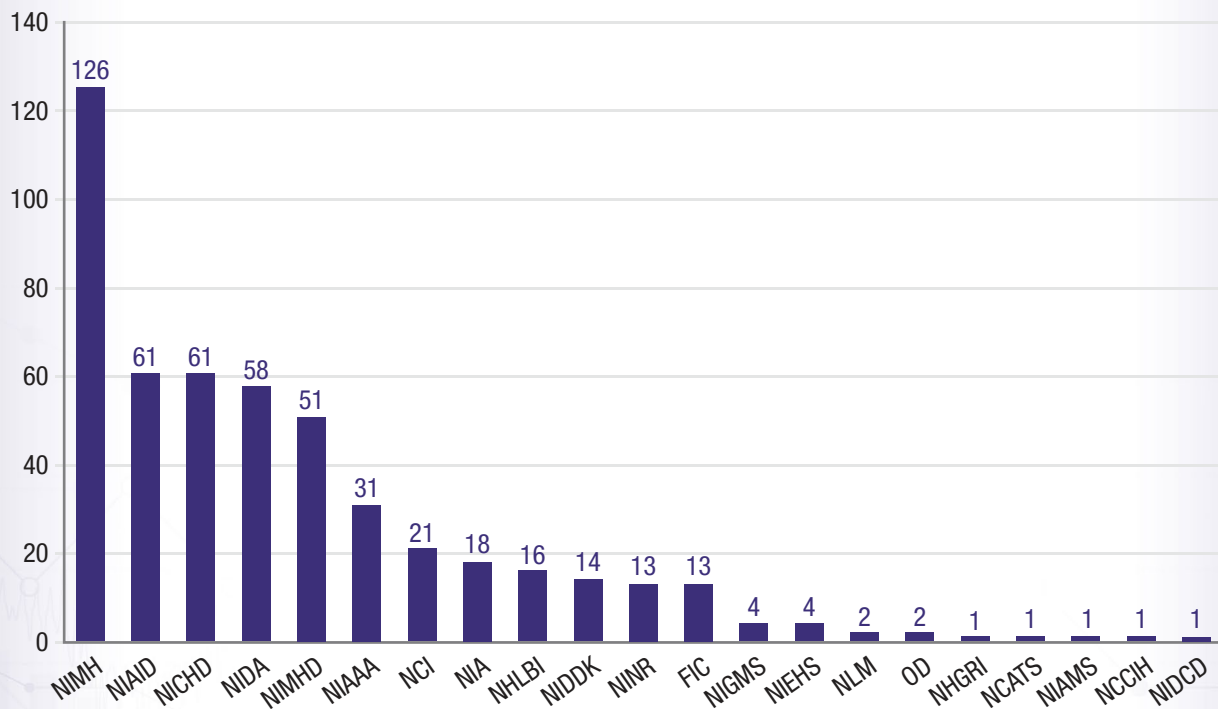
Note: Only ICOs with relevant data are included in this graph.

The number of SGM-related projects has increased in the majority of ICOs, indicating that the portfolio, in terms of number of projects, continues to grow across the NIH. Of the 21 ICOs reporting SGM projects for FY 2020, 17 (81.0%) experienced an increase in the number of projects since FY 2019. Of the 12 ICOs reporting more than 10 projects in FY 2020, six (50.0%) have more than doubled their number of funded projects since FY 2016. The graph below presents data since 2016. Data from 2015, when the analysis was first performed, may be found in previous versions of the portfolio analysis. For a list of abbreviations for all NIH ICOs, see Appendix II.

Figure 2. FYs 2016–2020, Number of SGM-Related Projects, by NIH ICO
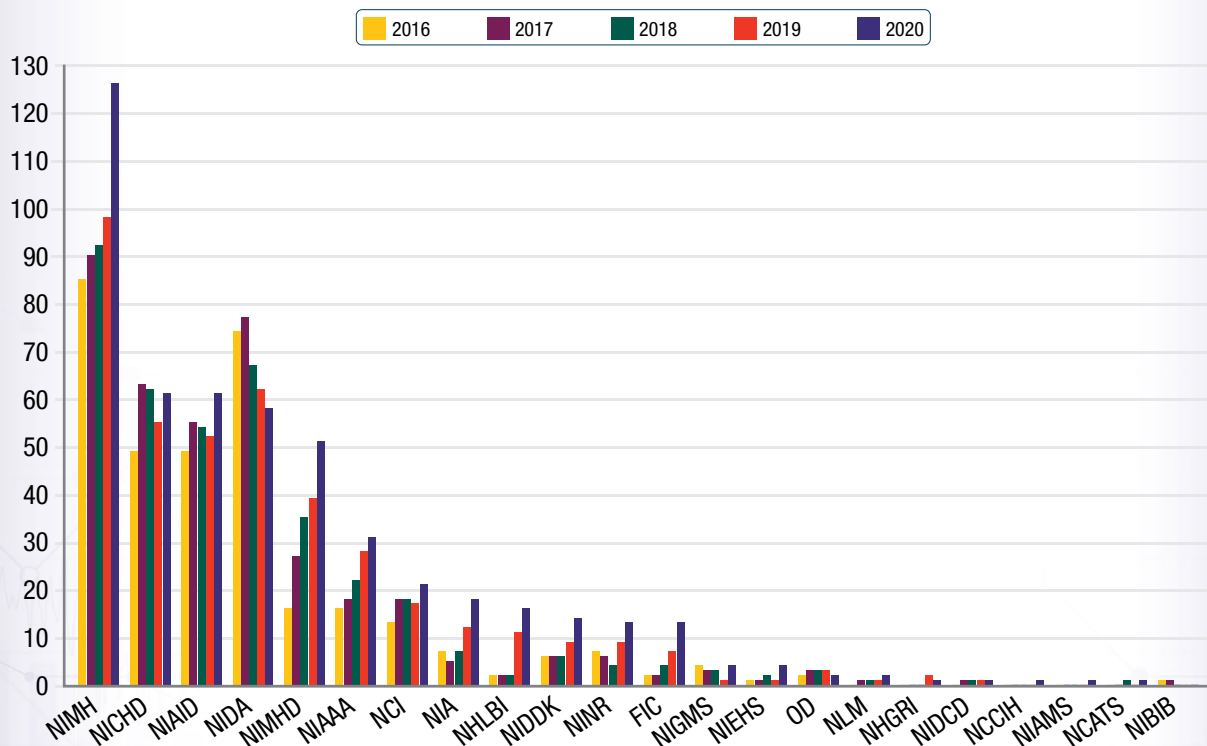**(2016 = 334, 2017 = 379, 2018 = 384, 2019 = 408, 2020 = 500)**

Note: The number of SGM-related projects by NIH ICO for FYs 2016–2020 can be found in Appendix III.

SGM Research Funding, by Institute, Center, or Office (ICO)

The total amount of funding for SGM-related research in FY 2020 was $284,051,683. The same ICOs that fund the largest number of projects also provide the most funding support. Specifically, NIAID, NIMH, NIDA, and NICHD together accounted for 74.2% of NIH SGM funding in FY 2020 (a total of $210,765,923).

It is noteworthy that NIAID is the single largest funder of SGM research and contributes more than 2.5 times the amount of the next largest–funding IC, with a total of $111,671,498. NIAID had previously funded $97,513,633 in FY 2019, $156,276,560 in FY 2018, and $99,922,189 in FY 2017. Note that the NIAID HIV/AIDS Clinical Trials (CT) Networks are funded annually over a 7-year cycle through five large, multisite, multi–Principal Investigator (PI) cooperative agreements. Due to the complex nature of tracking and reporting funding allocations to these networks, funding totals for NIAID may fluctuate from year to year. This may result in a large increase or decrease in SGM-related funding that does not correspond with the increase or decrease in projects. For this reason, and due to the total funding amount, NIAID has been excluded from the graph below. For a list of abbreviations for all NIH ICOs, see Appendix II.

Figure 3. FY 2020, SGM Research Funding, by NIH ICO (Excluding NIAID)
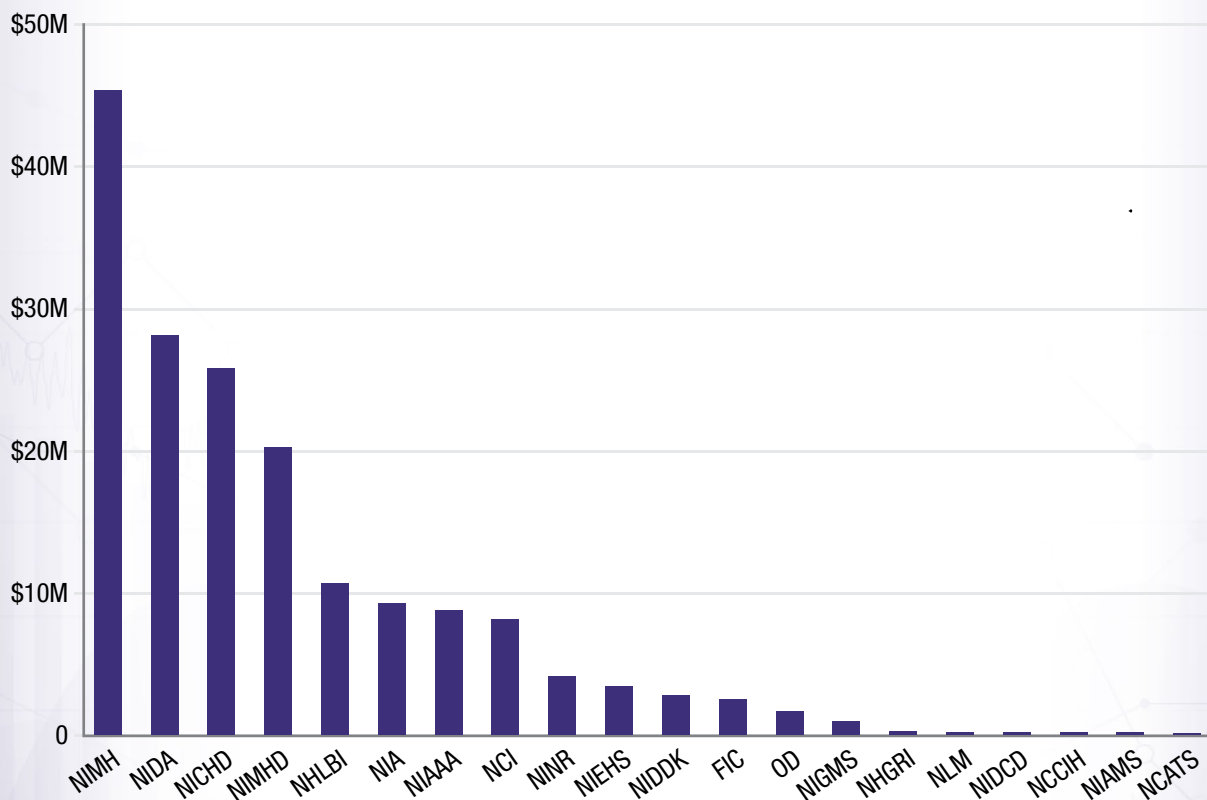
Note: Dollar amounts are in millions. For actual dollar amounts, please see Appendix IV.

The majority of NIH's SGM projects (59.8%, or 299 of 500) pertain to HIV/AIDS and are considered "HIV/AIDS-specific" based on a metric established for the categorization of projects by spending category, meaning the project addresses HIV/AIDS. Some projects are "HIV/AIDS-relevant," meaning that they pertain in some way to HIV/AIDS but are not included in the HIV/AIDS category because another methodological, population, or topical focus is considered primary. The prevalence of HIV/AIDS-related projects (both specific and relevant) reflects the historical and contemporary disproportionate incidence and prevalence of HIV/AIDS among SGM persons, particularly MSM and transgender women. In addition, for decades, people conducting SGM research could more readily obtain funding by conducting HIV/AIDS-related research. The percentage of HIV/AIDS-related projects compared with non-HIV/AIDS projects in the FY 2020 SGM research portfolio decreased to 59.8%, which is the lowest level observed since the SGMRO began reporting on this metric in FY 2015. The proportion of HIV/AIDS-related projects in the SGM research portfolio in previous years were as follows: 64.0% in FY 2019; 63.0% in FY 2018; 67.0% in FY 2017; and 73.0% in both FY 2016 and FY 2015. This represents a 13.2% decrease in these projects since 2015 as a proportion of the SGM portfolio.

Figure 4. FY 2020, HIV/AIDS Projects in the SGM Portfolio (*N* = 500)
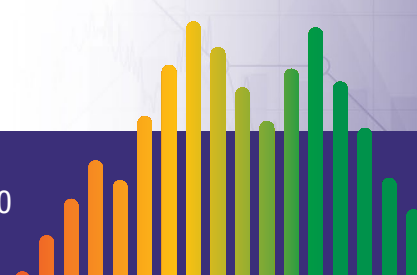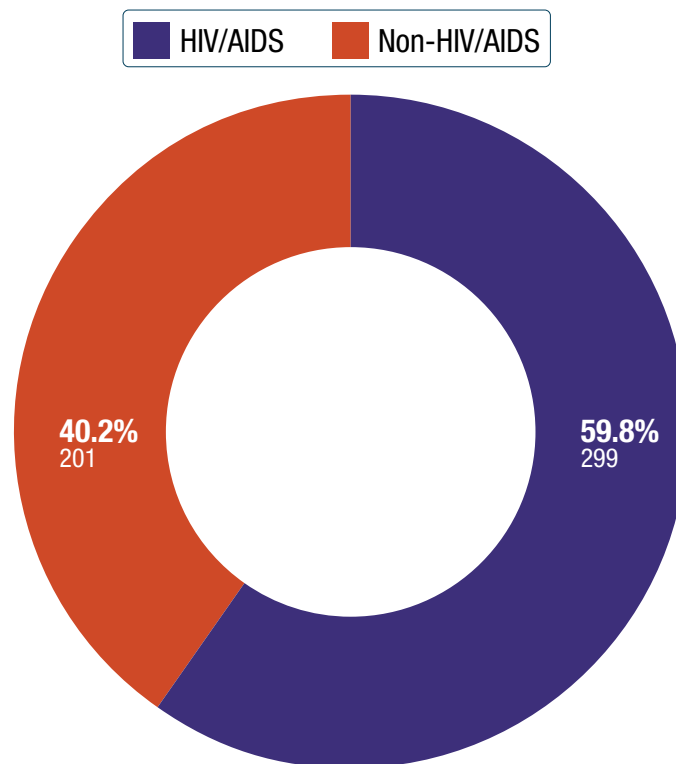
The number of SGM-related projects not focused on HIV/AIDS grew between 2016 and 2020 from 90 to 201, an increase of 123.3%. During that same time period, the number of ICOs reporting SGM projects that included an area of health outside of HIV/AIDS increased from 14 to 21. The graph below presents data since 2016. Data from 2015, when the analysis was first performed, may be found in previous versions of the portfolio analysis. For a list of abbreviations for all NIH ICOs, see Appendix II.

Figure 5. FYs 2016–2020, Number of Non-HIV/AIDS SGM-Related Projects, by NIH ICO (2016 = 90, 2017 = 124, 2018 = 142, 2019 = 147, 2020 = 201)
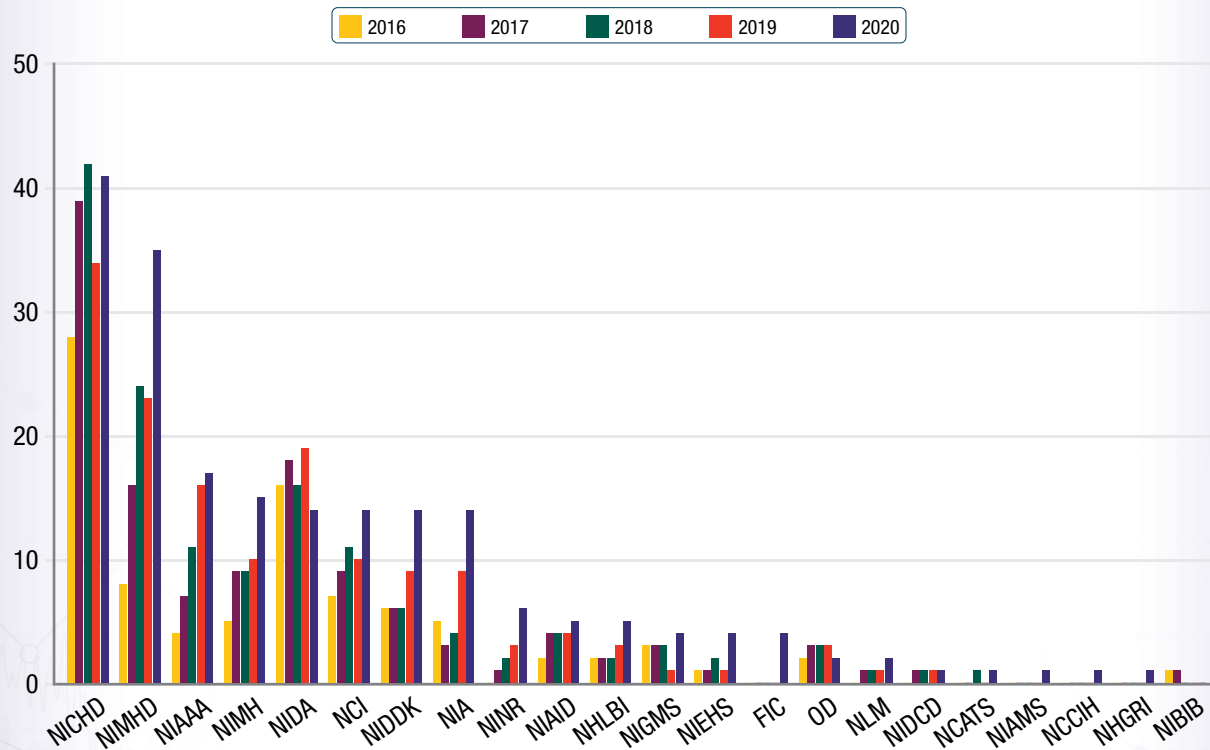
Note: The number of non-HIV/AIDS SGM-related projects by NIH ICO for FYs 2016–2020 can be found in Appendix V.

A broad range of RCDC categories were addressed in SGM-related projects funded in FY 2020. These projects may focus on the diseases or conditions themselves, associated health care access or utilization, or another topic in the context of specific diseases or risk factors. The graph below illustrates the proportion of projects within selected existing RCDC categories. The number of projects in fields outside of HIV/AIDS has increased in each of the past five years. For FY 2020, other than HIV/AIDS, the most common areas included Mental Health; Substance Abuse (Use); Sexually Transmitted Infections; and Alcoholism, Alcohol Use, and Health. Additional projects addressed the following: Violence Research; Aging; Cancer; Contraception/Reproduction; Suicide (including suicide prevention); Depression; Dementia (including Alzheimer's Disease); Obesity; Tobacco Smoke and Health. A small number of projects looked at Eating Disorders (three projects), Opioids (two projects), and Teenage Pregnancy (one project). Categories reported below are not mutually exclusive, because a project can focus on more than one disease area or health condition; therefore, percentages add to more than 100%.

Figure 6. FY 2020, Proportion of SGM Projects, by Research, Condition, and Disease Category (*N* = 500)

The number of SGM projects as a proportion of all NIH projects within an RCDC provides a broader context for the SGM health research portfolio. In four of the 16 selected categories presented below, SGM health research was 6% or more of all NIH-funded research: Sexually Transmitted Infections; Violence Research; HIV/AIDS; and Suicide. All remaining categories had a proportion of SGM projects between 0.2% and 2.8% of the overall NIH projects. Some of the categories that fall below 3% of the NIH portfolio include Depression (1.2%), Aging (0.3%), and Cancer (0.2%). A number of categories also exist where no SGM health research is funded, but a body of literature is developing that indicates need, such as with climate change. Categories reported below are not mutually exclusive, because a project can focus on more than one disease area or health condition.

Figure 7. FY 2020, SGM Projects as a Percentage of All NIH Projects, by Selected Research, Condition, and Disease Categories (*N* = 500)
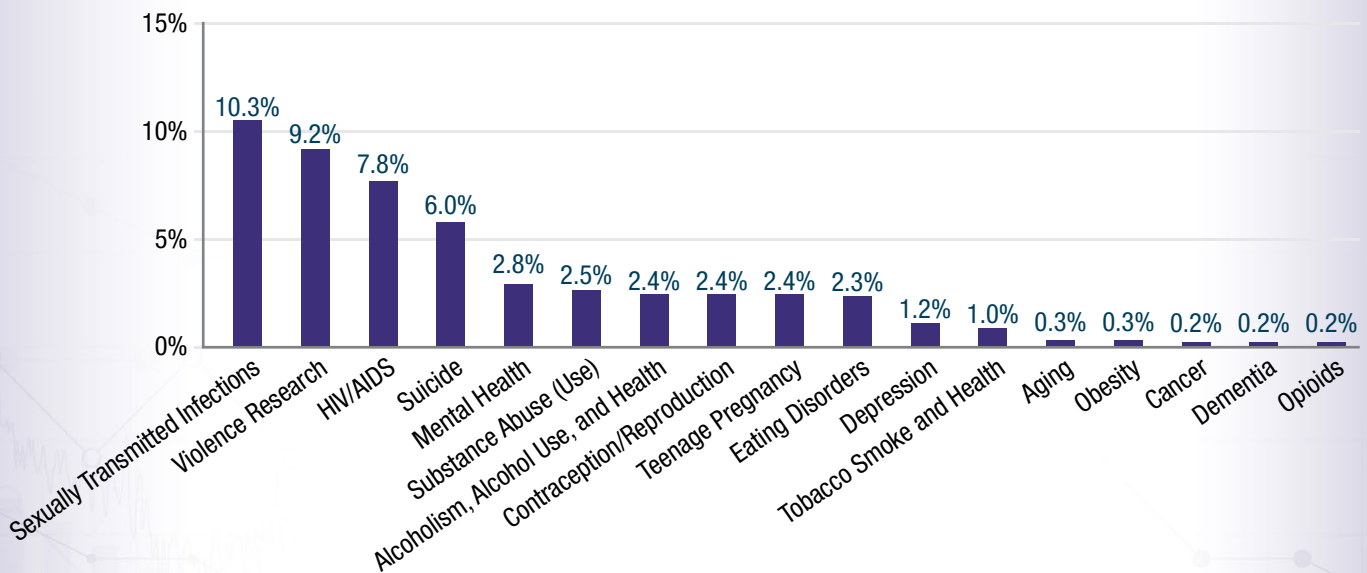
Note: The total number of projects for all NIH within these RCDC categories can be found in Appendix VI.

SGM Funding, by Research, Condition, and Disease Category

The amount of funding in each of the RCDC areas listed below corresponded roughly to the number of grants in those areas. Funding in HIV/AIDS totaled $212.9 million. Funding for SGM research related to Substance Abuse (Use), Mental Health, Sexually Transmitted Infections, and Cancer all exceeded $26 million. Categories reported below are not mutually exclusive and represent multiple areas of research within the RCDC categorization system; therefore, dollars may be counted toward more than one disease area, health condition, or research topic.

Figure 8. FY 2020, Total Grant Dollars, by SGM Research, Condition, and Disease Category
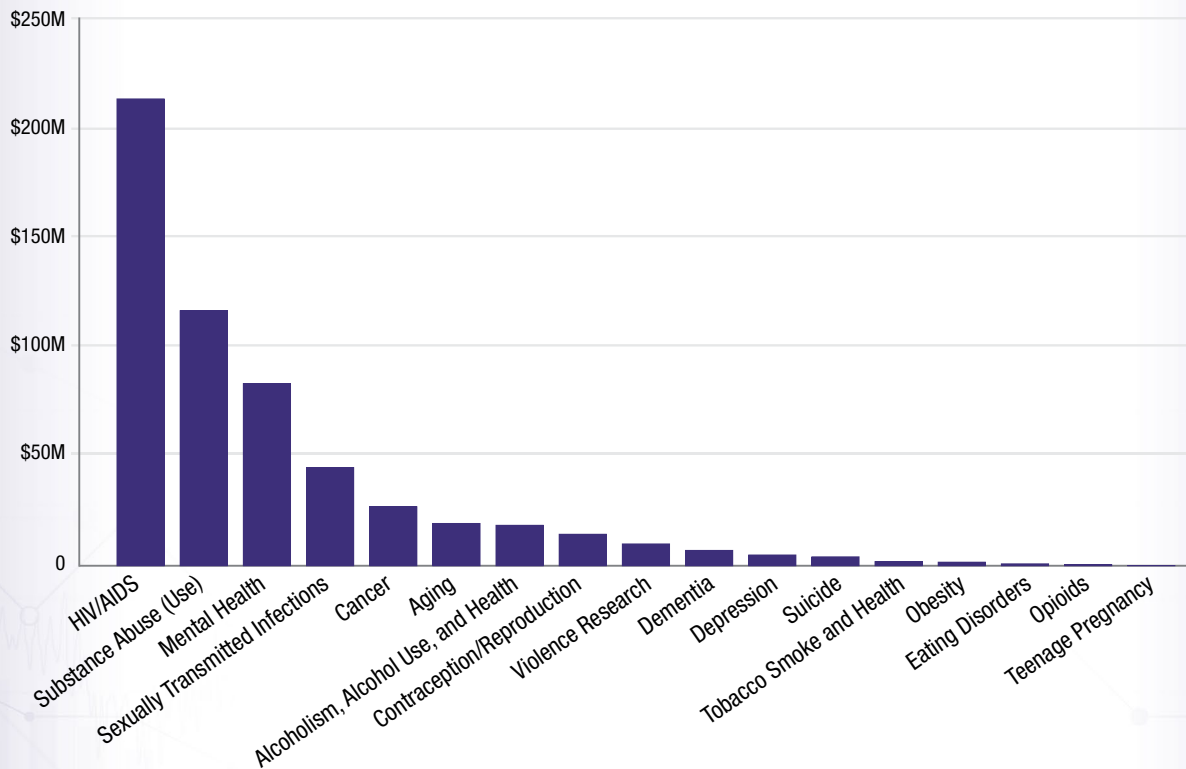
Note: Dollar amounts are in millions. Actual dollar amounts appear in Appendix VII.

Proportion of SGM-Related Projects, by NIH Grant Mechanism

The distribution of projects by grant mechanism allows a comparison of the percentages going to research projects, career development awards, research centers, and other categories. The Research Project (R) mechanism constituted the majority of grants (61.6%), followed by Cooperative Agreements (U; 13.6%), and Research Career Programs (K; 14.8%). Fellowships (F; 3.8%), Research Program Projects and Centers (P; 3.4%), and Intramural Projects (Z; 1.2%) accounted for 8.4% of the portfolio. Institutional Training and Director Program Projects (D), Support of Competitive Research Program (SCORE), Research Project–Other Transaction Awards (OT2), Training Grants (T32), and Resources Project Grants (G08)—each accounting for <1% of total funding—together totaled eight projects, or 1.6% of the total SGM portfolio.

Figure 9. FY 2020, Proportion of Projects, by Grant Mechanism (*N* = 500)
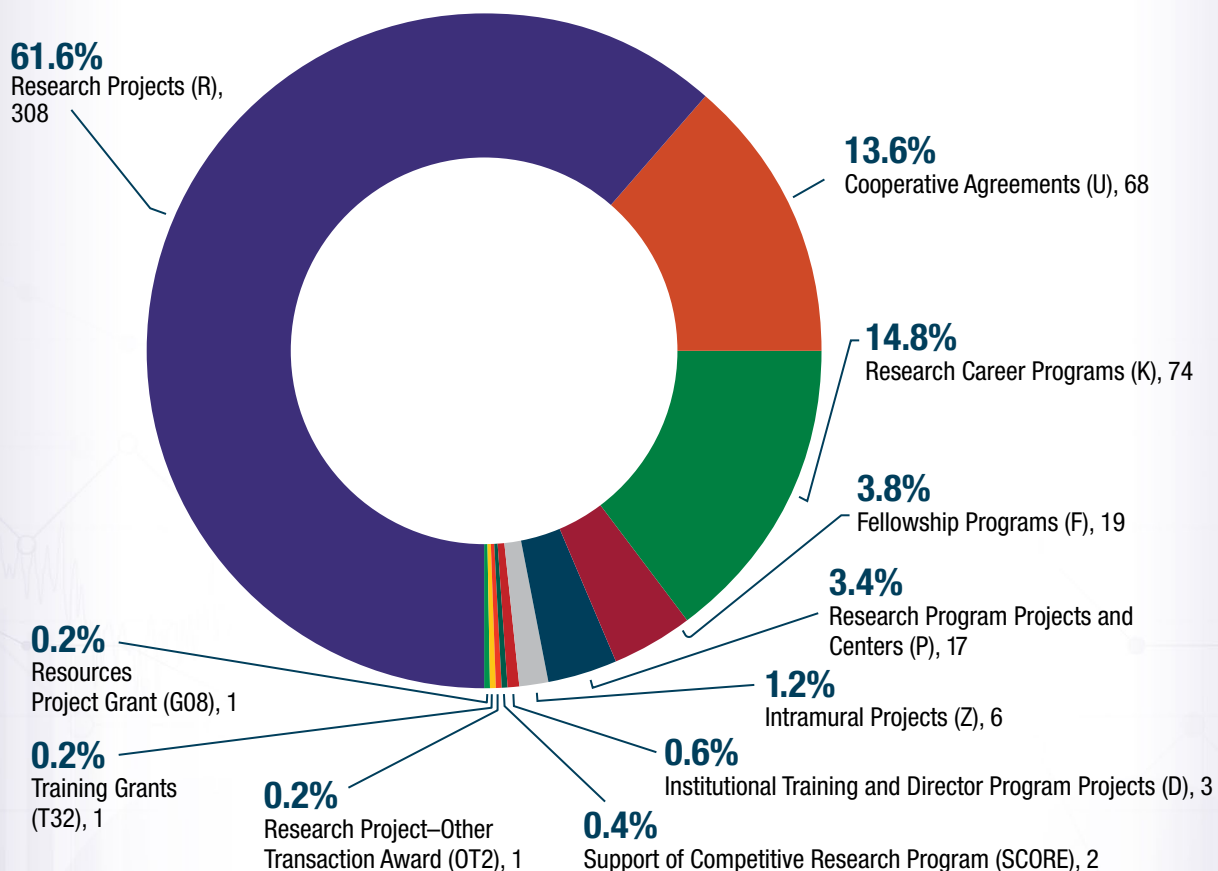
61.6%
Research Projects (R), 308

13.6%
Cooperative Agreements (U), 68

14.8%
Research Career Programs (K), 74

3.8%
Fellowship Programs (F), 19

3.4%
Research Program Projects and Centers (P), 17

1.2%
Intramural Projects (Z), 6

0.6%
Institutional Training and Director Program Projects (D), 3

0.4%
Support of Competitive Research Program (SCORE), 2

0.2%
Research Project–Other Transaction Award (OT2), 1

0.2%
Training Grants (T32), 1

0.2%
Resources Project Grant (G08), 1

Note: Percentages do not add up to 100% because they are rounded to the nearest tenth of a percent.

Proportion of SGM-Related Projects, by Type of Training or Career Funding Mechanism

The data below provide insight into progress made toward the strategic goal of fostering a highly skilled and diverse workforce. Research Scientist Development Awards (K01), Mentored Patient-Oriented Research Career Development Awards (K23), and Predoctoral Fellowships (F31) accounted for more than three-quarters (77.4%) of projects pertaining to training and career development in FY 2020. The total number of training- and career-related awards in FY 2020 was 93, reflecting an 89.8% increase in these types of awards since the 49 made in FY 2015.

Figure 10. FY 2020, Proportion of SGM-Related Projects, by Type of Training or Career Funding Mechanism (*N* = 93)
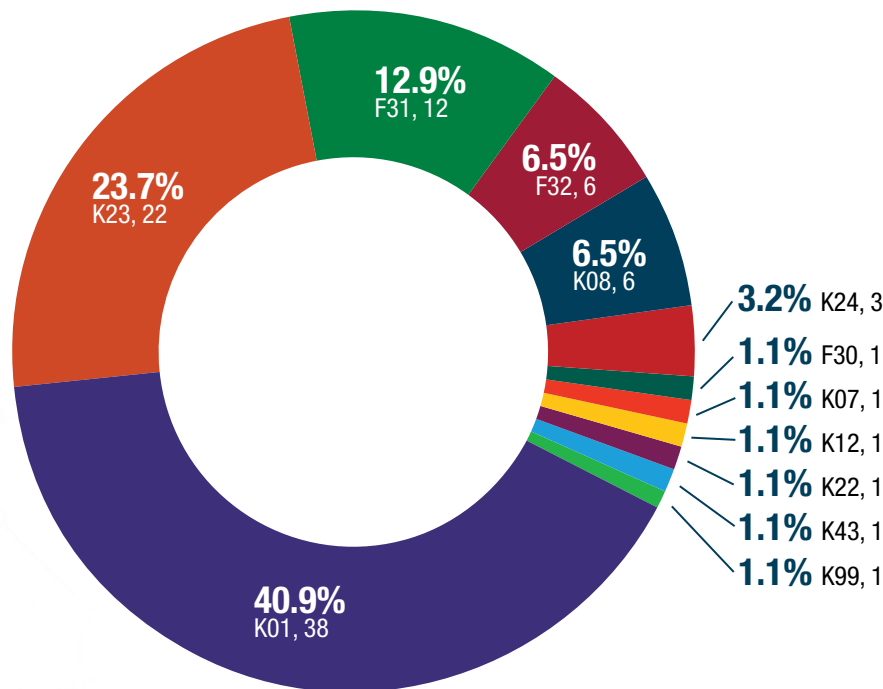
Note: Percentages do not add up to 100% because they are rounded to the nearest tenth of a percent.

Proportion of Projects with New and Early-Stage Investigators

Of the 174 R01 grant awards in SGM health research made in FY 2020, 11 (6.3%) were awarded to either New Investigators (NIs), who had not received substantial NIH funding prior to this award, or Early-Stage Investigators (ESIs), who had received their terminal degree within the last 10 years but had not yet been the PI on an R01.

Note that this statistic illustrates NI and ESI status at the time of the initial application and reflects the status of only the PI, not other members of the investigative team. An increase in the number of NIs and ESIs from year to year may indicate progress in advancing rigorous research on the health of SGM populations in the extramural community and fostering a highly skilled and diverse workforce. This statistic represents a decrease compared with FY 2019, when 15 New and Early-Stage Investigators (NESIs) were funded, but an increase since FY 2018, when eight NESIs were funded for SGM-related projects.

Figure 11. FY 2020, Proportion of Projects with New and Early-Stage Investigators (*N* = 174)

Legend: Yes NI/ESI | No NI/ESI

11
6.3%

163
93.7%

The vast majority of projects (488) in the SGM portfolio were made to organizations within the United States. SGM-related research funding was provided to institutions in 36 states, Puerto Rico, and the District of Columbia. The states with the largest number of projects (more than 30 each) were California, New York, Maryland, Massachusetts, and Illinois. Slightly more than half (254, or 52.1%) of funded SGM projects were administered by organizations in these five states. Delaware, Nevada, and New Hampshire each had projects for the first time in FY 2020. Together with Arkansas, Louisiana, and New Mexico, which had SGM projects for the first time in FY 2019, and South Carolina and Utah, which had projects for the first time in FY 2018, these eight states accounted for a geographical expansion of the portfolio of 27.6%. The map below indicates the location of the institutions that received funding in FY 2020 and not necessarily where project activity took place.

Figure 12. FY 2020, SGM Projects, by U.S. Location of Administering Institution (*N* = 488)
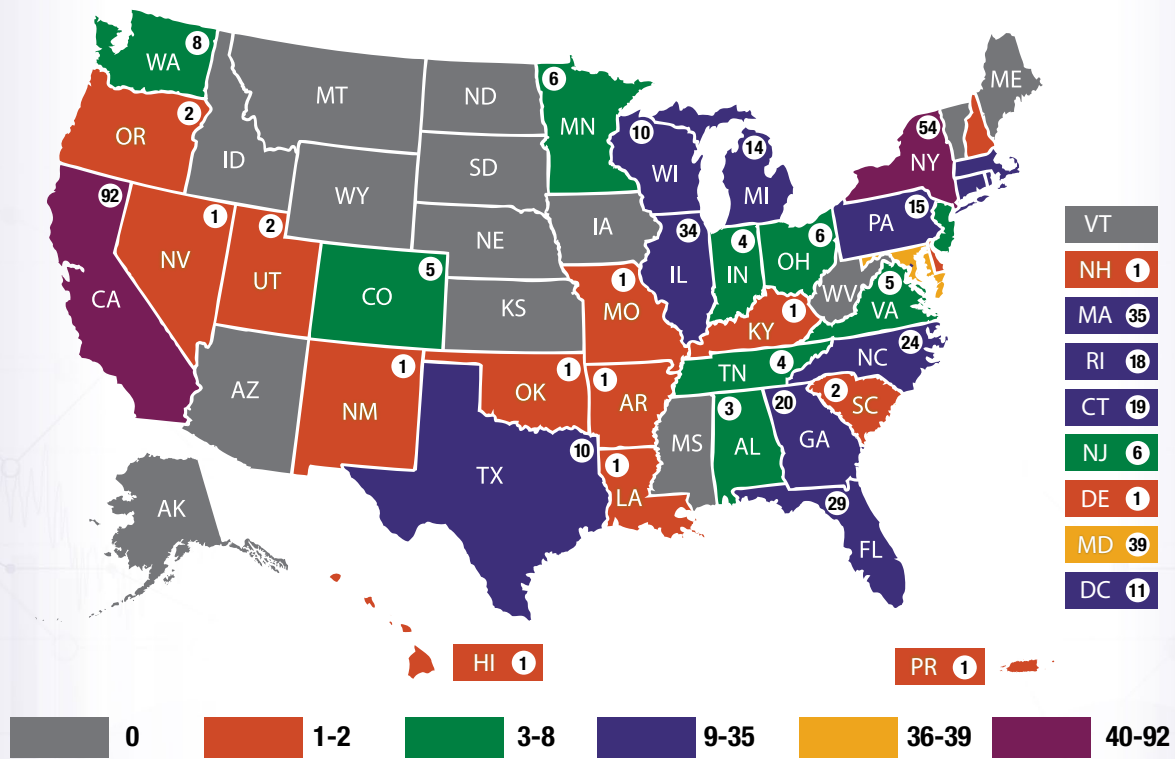
Note: Six projects are included on the map with Maryland because they took place on the NIH campus in the intramural program.

Funding of International SGM Research, by Country of Administering Institution

Funding for 12 SGM-related research projects was provided directly to foreign organizations in seven nations outside of the United States (Brazil, Canada, China, Peru, Thailand, Uganda, and the United Kingdom). More than half of these countries (57.1%) had multiple NIH-funded research grants, whereas in FY 2019, only one nation (Thailand) had more than one NIH-funded project.

Figure 13. FY 2020, SGM Projects, by Country (*N* = 500)

Legend: 0 (gray), 1 (orange), 2 (red), 3 (green), 488 (purple)

SGM Projects, by Institution

NIH provides funding for projects in SGM health research at institutions across the country and the world. The illustration below provides a visual representation of the specific domestic and global institutions with the largest number of projects. The visualization algorithm identifies and clusters projects by the location of the primary institution of the project grant. The area of the polygon is proportional to the number of awards. The projects in this visualization are unique and only counted once.

Figure 14. Proportional Representation of SGM Projects, by Institution

Note: The small size of some polygons around the edge of the image precludes displaying data. Contact SGMRO for more information.

SGM Projects, by Category

The SGM research portfolio also can be characterized in terms of the spending categories of each research project. In this illustration, an automated system uses RCDC indexing terms to group projects into various categories. These categories may be the focus of the research, such as *Mental Health*, or the type of research being conducted, as is the case with *Behavioral and Social Science*. The figure below depicts all categories to which any particular project in the SGM portfolio belongs, so any given project may belong to multiple categories in the visualization. The majority of projects belong to at least one category in addition to SGM, listed here as *SGM/LGBT*. The area of the polygon is proportional to the number of awards in the category.

Figure 15. Proportional Representation of SGM Projects, by Category

Note: The small size of some polygons around the edge of the image precludes displaying data. Contact SGMRO for more information.

The second half of the report highlights analyses that resulted from the manual curation of the SGM portfolio. As previously noted, only the title, abstract, and specific aims were reviewed during this process. As such, the values presented tend to be minimums. The projects presented in this portion of the report are from a full-year curation in FY 2018 and two partial-year curations in FY 2019 and 2020, when only the projects newly awarded for that year were curated. As a result, due to some projects having multiple budgets during that time period (2018–2020), the N for this section of the report is 529. As such, there may be slight discrepancies with previously published data.

Each project was assigned at least one "population" that falls under the SGM umbrella based on various identities, behaviors, or diagnoses, and projects were assigned all relevant populations identified in the project description. Definitions of these populations appear in the key for this graph. This was done to enumerate the various communities under study throughout the SGM portfolio. More than half of the portfolio (55.0%) consisted of projects with a focus on or relevance to MSM. More than one in five projects pertained to transgender individuals (21.9%). The third-largest population category was bisexual, representing 17.2% of the projects. Gay was the fourth-largest population, being identified in 14.6% of the projects in the portfolio. More than one in 10 projects (12.3%) did not identify specific LGBT populations but indicated that LGBT individuals are under study in the project. The categories of lesbian, intersex, and DSD pertained to fewer than one in 10 projects. Sexual orientation categories not previously mentioned, conceptual investigation of sexual orientation, and other gender identities all pertained to fewer than one in 20 projects. No projects were Two-Spirit focused in FY 2020, although two projects explicitly included American Indian and Alaska Native populations (see page 22). The proportion of projects belonging to each category are depicted in the figure below. Categories are not mutually exclusive; therefore, percentages add to more than 100%. As noted previously, population is an indication in the title, abstract, or specific aims that an element of the project pertains to the health of a given group; it does not necessarily mean that the project is primarily about or specific to that population.

Figure 16. FY 2020, Proportion of SGM Projects, by Population (*N* = 529)
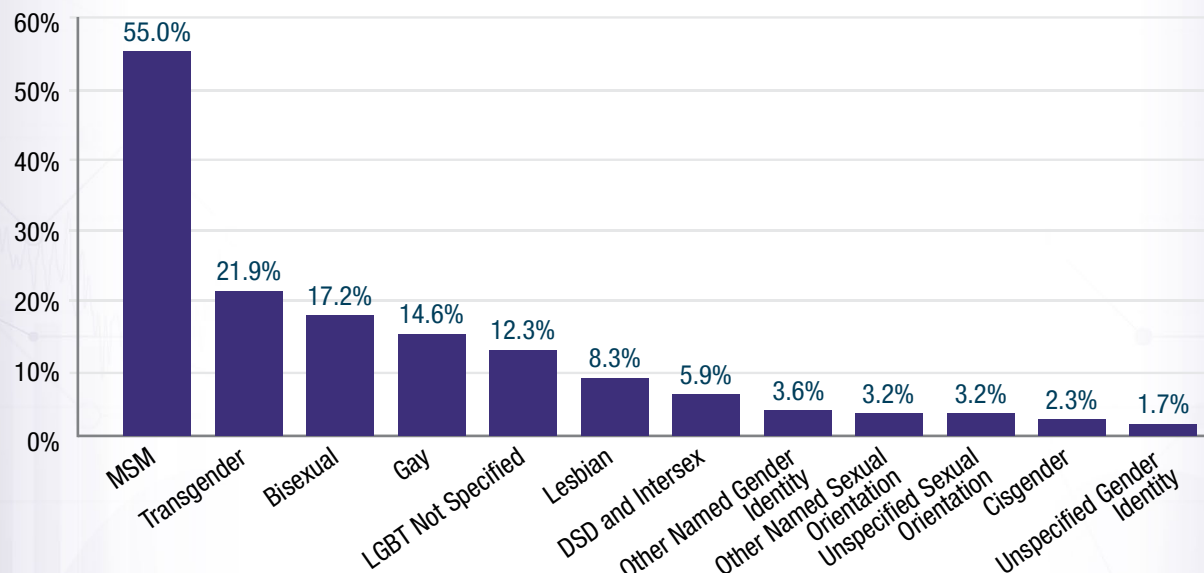
Key:
Cisgender = the project conceptually investigates gender identity that aligns with sex assigned at birth. **DSD and Intersex** = disorders or differences of sex development and intersex populations. **LGBT Not Specified** = the project does not specify a population but indicates an LGBT population is included. **MSM** = men who have sex with men. **Other Named Gender Identity** = gender identity other than transgender (e.g., non-binary, gender non-conforming, etc.). **Other Named Sexual Orientation** = other named sexual orientation categories not previously listed (e.g., queer, pansexual, etc.). **Unspecified Gender Identity** = the project conceptually investigates gender identity but does not specify a gender minority identity. **Unspecified Sexual Orientation** = the project conceptually investigates sexual orientation but does not specify a sexual minority identity.

Proportion of SGM Projects, by Race and Ethnicity

A majority of projects (345 of 529, or 65.2%) did not identify a specific racial or ethnic group included in the study. However, for those projects that specified inclusion of racial or ethnic groups, African Americans were included at the highest rate (20.0%). Hispanics were included at a lower rate (11.2%). Multiple races, which includes projects where multiple races were indicated as a group (e.g., with language like *people of color)*, accounted for roughly one in 10 or (10.4%) of the portfolio. Asian was specified in 2.8% of projects. American Indians and Alaska Natives (0.4%) and Native Hawaiian and other Pacific Islanders (0.2%) were included at the lowest rates.

Figure 17. FY 2020, Proportion of SGM Projects, by Race and Ethnicity (*N* = 529)
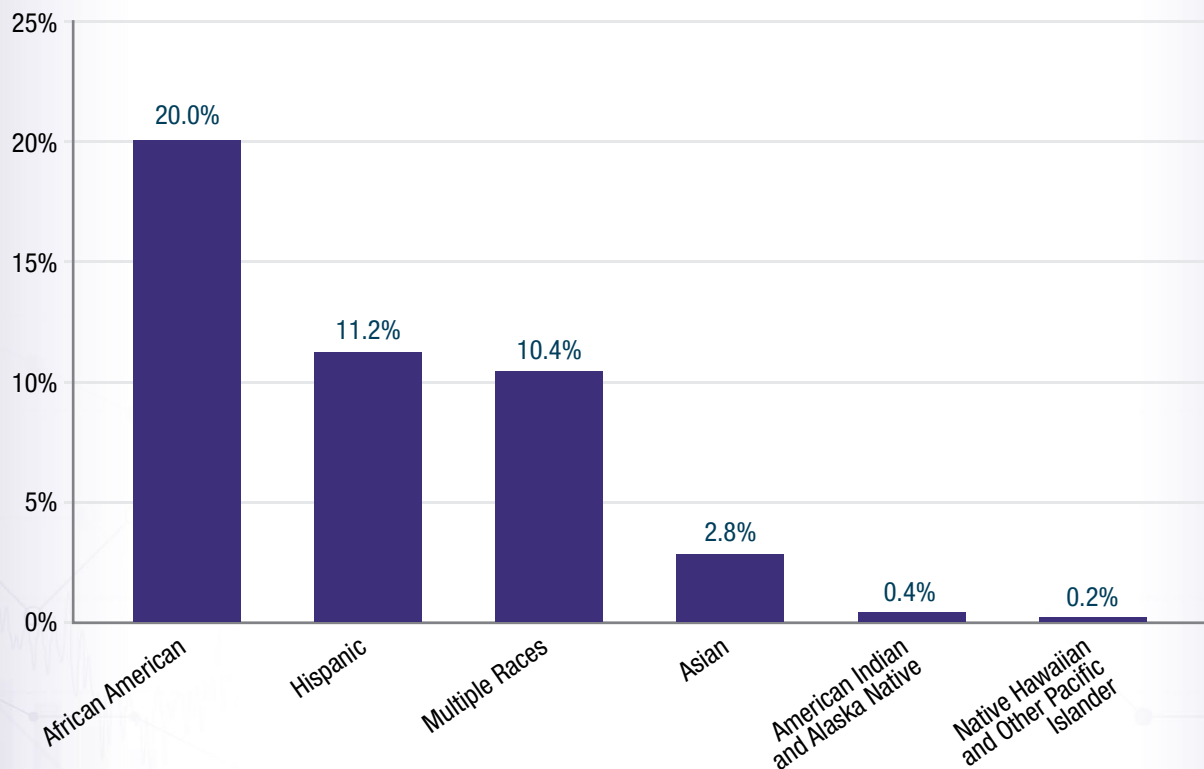
Proportion of SGM MSM-Related Projects, by Race and Ethnicity

MSM is the single largest population category under study in SGM health research funded by NIH. To understand in more detail how race and Hispanic ethnicity has been studied in funded projects, a crosstabulation with MSM is included below. Some projects identified more than one racial or ethnic group, and projects may have multiple populations under study.

MSM were represented in 50% or more of projects within each race category except multiple races, in which they still account for nearly half of the projects (45.5%). MSM also represent a majority of projects in which Hispanic ethnicity was identified. Because of the large number of projects that do not appear to have information about race associated with the study population, we are limited in the inferences that may be made with this comparison. Projects are included in this analysis only if the title, abstract, and specific aims include information about both race and study population.

Table 1. FY 2020, Proportion of SGM Projects, by Race and Ethnicity and MSM Populations (*N* = 529)

Race/Ethnicity Category	Total Number of Projects Within Race/Ethnicity Category	Proportion of Projects (of 529)	Number of MSM Projects	Proportion of MSM Projects (of 291)	Proportion of Projects Within Race/Ethnicity Category That Are MSM (*N* Varies)
African American	106	20.0%	91	31.3%	85.8%
Hispanic	59	11.2%	42	14.4%	71.2%
Multiple Races	55	10.4%	25	8.6%	45.5%
Asian	15	2.8%	12	4.1%	80.0%
American Indian and Alaska Native	2	0.4%	1	0.3%	50.0%
Native Hawaiian and Other Pacific Islander	1	0.2%	1	0.3%	100.0%
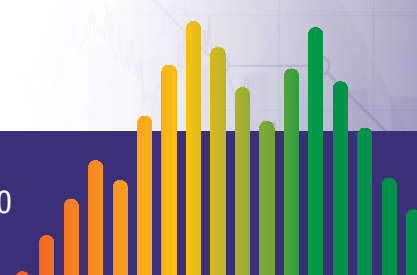
Proportion of SGM Projects, by Age Group

A total of 226 projects in the SGM portfolio (42.7%) specified an age group. Some projects identified more than one age group. It is likely that we are underrepresenting age groups because some projects that pertain to a specific age group did not make that explicit in the project descriptions. The age groupings are as follows: children (12 years and under), adolescents (13–17 years), young adults (18–35 years), adults (36–55 years), older adults (56–64 years), and elderly (65 years and older). The age group with the largest proportion of projects in the SGM portfolio was young adults (29.3%), followed by adolescents (18.1%), adults (10.6%), elderly (6.6%), older adults (5.7%), and children (3.0%).

Figure 18. FY 2020, Proportion of SGM Projects, by Age Group (*N* = 529)
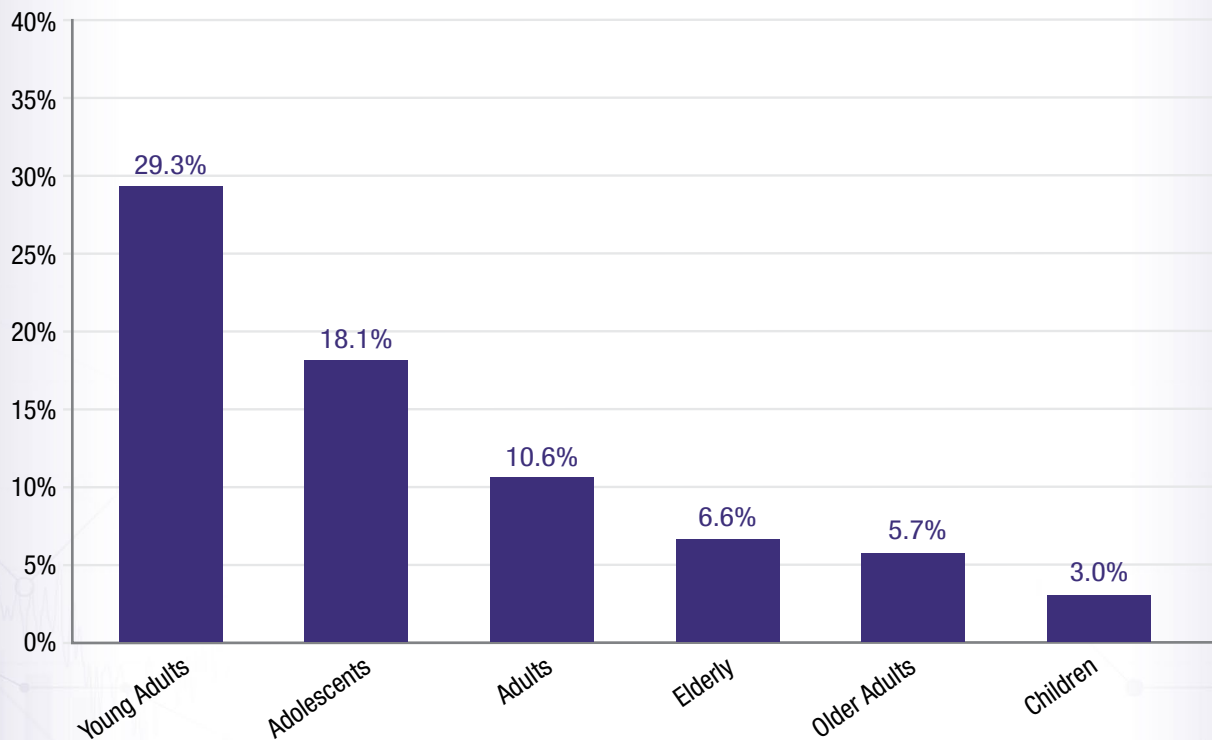
Proportion of SGM Projects, by Social Factor Categories

Below is a list of additional categories used to classify the 529 projects included in the curation analysis for FY 2020. The categories were based on feedback from SGMRO staff, the NIH SGM Research Coordinating Committee, and the NIH SGM Research Working Group of the Council of Councils about potential variables to include in this analysis. The categories reflect an increased interest in the intersection of social factors with sexual orientation and gender identity. However, because of the small numbers, only the total number of relevant projects in each category, and not the proportions, is presented in the table below. Notably, for the second year in a row, no projects looked at children involved in the foster care system. Low socioeconomic status was associated with the largest number of projects. These numbers are minimums because other projects may have included members of these groups without specifically identifying them in project descriptions. The extent to which these numbers differ from FY 2019 have been noted in the table in parentheses, with a plus sign indicating an increase over last year, a minus sign indicating a decrease, and a zero indicating no change.

Table 2. FY 2020, Social Factor Categories in the SGM Portfolio (*N* = 529)

Other Research Categories	Number of Projects
People identified as low socioeconomic status	19 (+1)
People who live in rural areas	14 (+3)
People involved with the criminal justice system	10 (+1)
People who have immigrated from other countries	6 (+4)
People experiencing homelessness	4 (-5)
People living with disabilities	3 (0)
People who have served in the U.S. Armed Forces	3 (0)

Each of the projects was curated for the research methods used in the study. More than two-thirds of the projects (72.2%) either were observational studies (37.8%) or employed mixed methods (34.4%). Nearly three in 10 (29.9%) were pilot/feasibility/proof-of-concept/safety studies, whereas more than one-quarter of projects (27.6%) were randomized intervention studies. More than one in six projects (17.6%) employed analyses of existing data, and 11.5% involved qualitative methods as the primary research method. Nearly one in 10 (9.8%) employed some other type of research method. Additionally, 8.5% of the projects were non-randomized intervention studies. The same project can appear in more than one category; therefore, the total percentage across categories exceeds 100%.

Figure 19. FY 2020, Proportion of SGM Projects, by Research Methods (*N* = 529)

Each of the projects also was curated based on the type of study. Seven study categories were coded, and the majority of projects were coded as prevention research (81.3%). Behavioral research was conducted in more than half of all projects (55.4%), and social science methods were utilized in more than one in five projects (23.6%). Smaller proportions of the projects in the portfolio fell under the categories of clinical trials (8.9%), methods/measurement research (8.5%), and policy research (4.3%). Other types of studies—those that did not fall within the existing categories—accounted for 12.7% of projects. The same project may appear in more than one category; therefore, the total percentage across categories exceeds 100%.

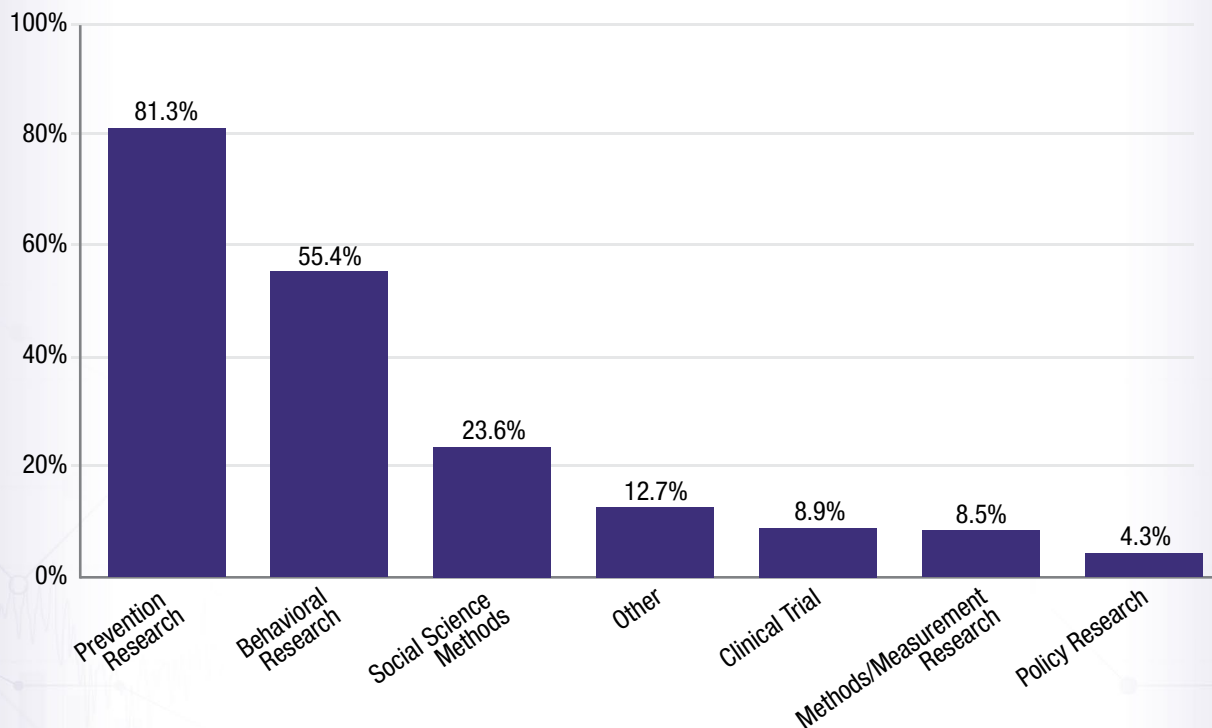**Figure 20. FY 2020, Proportion of SGM Projects, by Type of Study (*N* = 529)**

Proportion of SGM Projects, by Special Topic Category

A number of other topics of interest in SGM health research did not fit into the groupings previously described but were curated to enumerate projects investigating these topics so they can be tracked over time. More than two in five (40.6%) projects were categorized as health disparities research. For the purposes of this analysis, health disparities projects were included if they used an SGM population in comparison to another group. More than one in four projects (26.3%) had a technological component, such as a website, mobile phone application, or computer. Often, these studies involved health information, medication tracking and reminders, interventions, or social networks. More than one in six projects (17.8%) pertained to stigma, and more than one in six projects (17.6%) had an international component, taking place in or concerning a population outside the United States. Minority stress and discrimination pertained to 11.2% and 9.1% of projects, respectively. More than one in 20 (7.0%) projects pertained to hormones, their use, their production, or their effects on development. Smaller percentages of projects pertained to trauma (3.4%), human papillomavirus (2.1%), sex work (1.9%), or the environment (0.4%). Note that all projects were curated, but not all projects included a special category of interest.

Figure 21. FY 2020, Proportion of SGM Projects, by Special Topic Category (*N* = 529)
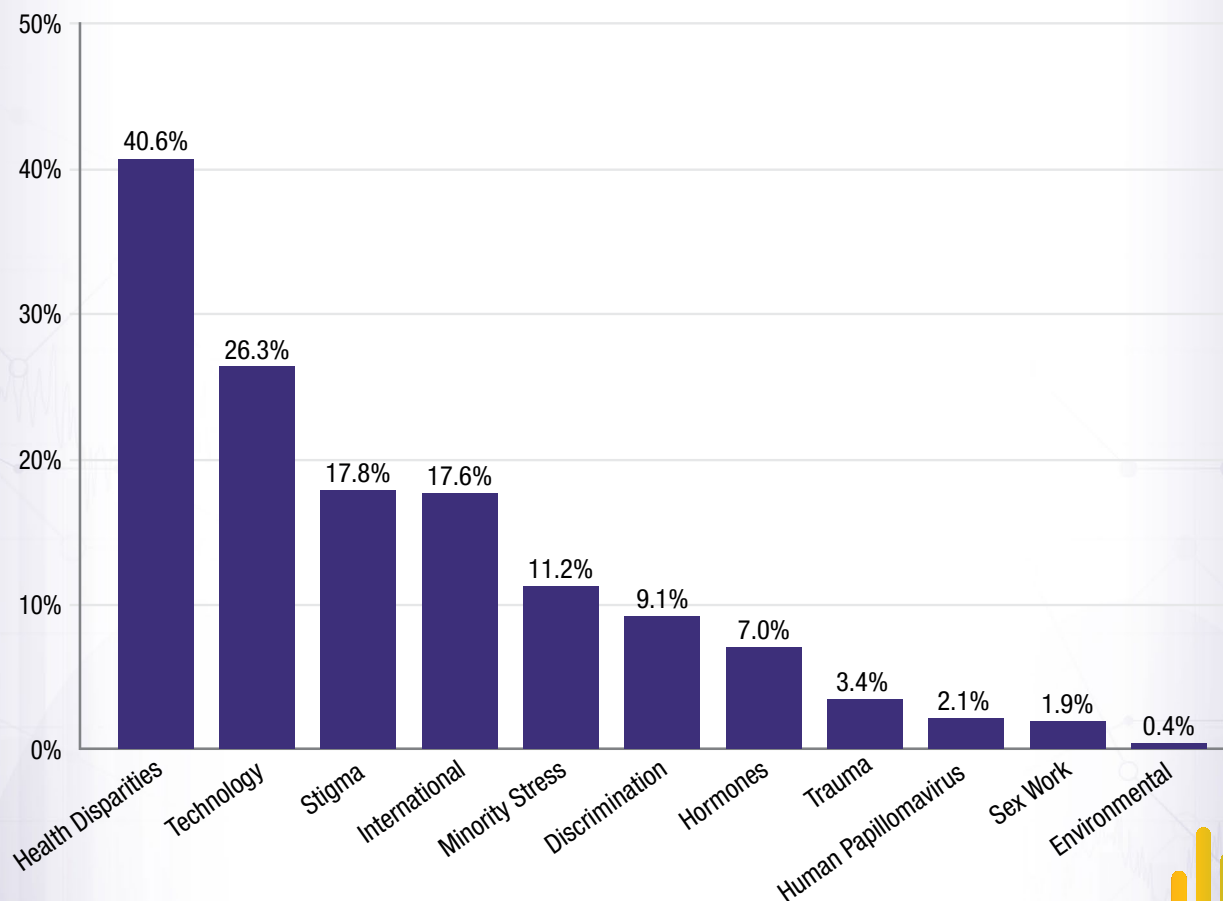
Relative Citation Ratio

The Relative Citation Ratio (RCR) measures the scientific influence of each paper resulting from SGM-funded grants by field- and time-adjusting the citations it has received and benchmarking to the median for NIH publications (1.0). The process for calculating the RCR using the NIH *iCite* tool, which was used to perform this analysis, is described in detail in an article from 2016. Because not all published papers reference the related NIH grant, these numbers are minimums.

In 2020, there were 1,443 articles published that are linked to those core grants/projects in the SGM portfolio for FY 2020 with a mean RCR of 2.28. Publications are not linked at the application level. For context, included below is a graph of all SGM health–related articles (*N* = 8,936) published from 1985 to 2020 funded research by NIH (mean RCR = 1.96). Also noteworthy is that nearly 60% (*N* = 5,234) of all publications associated with SGM health–related funded NIH grants, were published between 2016 and 2020.

Figure 22. Supporting Data for RCR: Distinct Count of PubMed IDs (PMID), by Year
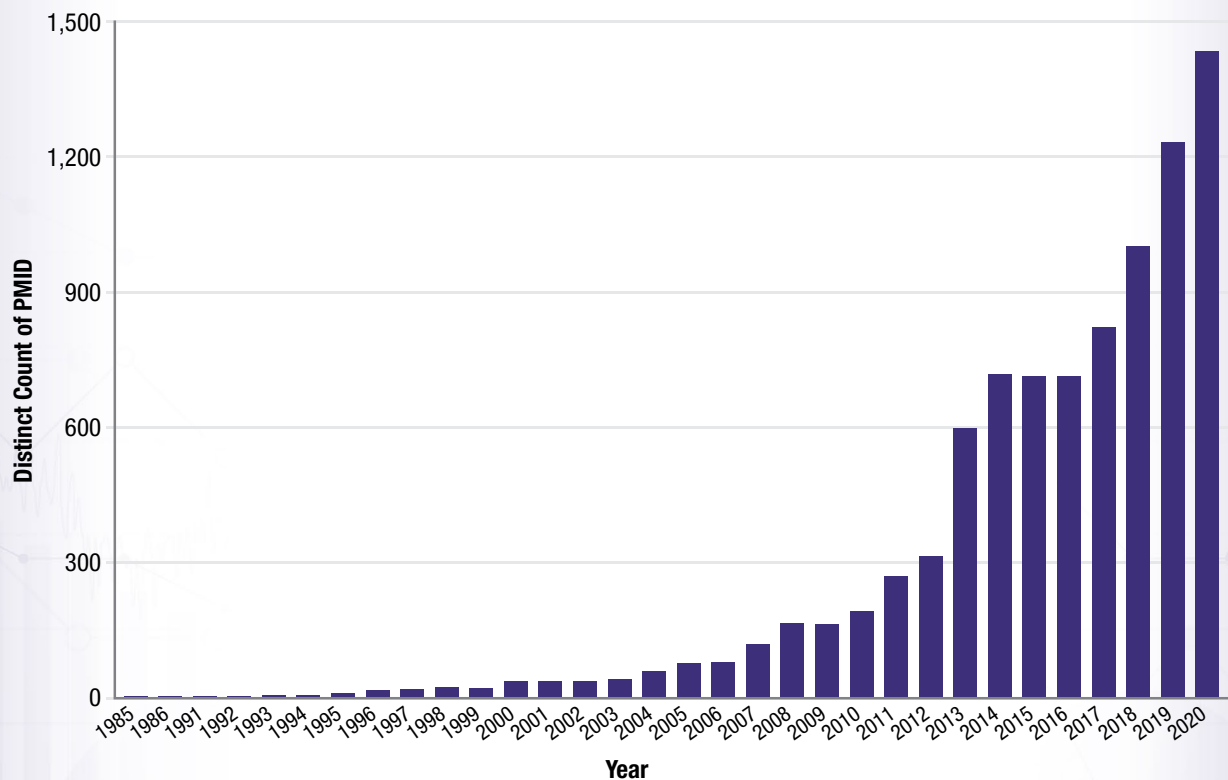
CONCLUSION

The number of projects in the NIH SGM health research portfolio has increased gradually since 2015. This is true for the increase in the total number of projects and total funding, as well as for the number of projects that involve research beyond HIV/AIDS. The increased investment in non-HIV/AIDS-related projects over the past 6 years has contributed to the broadening of the SGM health–related topics under investigation. Additionally, the total number of training- and career-related awards in FY 2020 increased by 89.8% over FY 2015. These trends indicate the long-term commitment of the NIH to support SGM health research and the SGM health research workforce.

The NIH SGM-related portfolio is diverse. An estimated one in five projects involved African Americans, and projects spanned the life course, with work on aging being the seventh-largest research category. Additionally, this year's curation identified projects in such groups as people who live in rural areas, people with disabilities, and people who have served in the U.S. armed forces, among others. The topics were also broad ranging and timely, such as environmental health and opioid use. As noted previously, funded projects have expanded geographically as well. Between FYs 2018 and 2020, SGM-related projects were funded in eight new states.

The FY 2020 SGM portfolio is the largest to date, funded by more NIH ICOs than ever before. But many unanswered questions persist. Fourteen states have never had an organization with a funded SGM health research project. A number of categories of research tracked by the SGMRO were again notably absent from the FY 2020 SGM portfolio, including children involved in the child welfare system and Two-Spirit people. These further considerations highlight the need for additional research across the spectrum of disease areas and health conditions and underscore that opportunities abound in SGM health research.
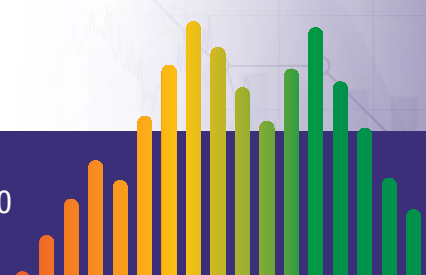
APPENDIX I

CURATION VARIABLES

Population

Bisexual
Cisgender
Gay
Gender Identity Other
Lesbian
LGBT, not specified
MSM
Other Named Sexual Orientation
Transgender
Unspecified Sexual Orientation

Race/Ethnicity

African American
American Indian and Alaska Native
Asian
Native Hawaiian or Other Pacific Islander
Hispanic Ethnicity
Multiple Races

Sex

Male
Female
DSD and Intersex

Age

Children (12 and under)
Adolescents (13 to 17)
Young Adult (18 to 35)
Adult (35 to 55)
Older Adult (56 to 64)
Elderly (65 and above)

Other Research Categories

People identified as low socioeconomic status
People who live in rural areas
People experiencing homelessness
People involved with the criminal justice system
People living with disabilities
People who have served in the U.S. Armed Forces
People who have immigrated from other countries

Research Methods

Analysis of Existing Data
Non-Randomized Intervention Study
Observational Study
Pilot/Feasibility/Proof-of-Concept/Safety Study
Randomized Intervention Study
Qualitative Measures
Methods Research
Mixed Methods
Other Research Method/s

Type of Study

Clinical Trial
Prevention Research
Methods/Measurement Research
Behavioral
Social Science Research
Policy
Other Type of Study

Other

Environmental
Sex Work
Hormones
Trauma
Human Papillomavirus (HPV)
Health Disparities
International
Technology
Stigma
Minority Stress
Discrimination

APPENDIX II

NIH INSTITUTES, CENTERS, AND OFFICES

NIH Institutes

National Cancer Institute (NCI)
National Eye Institute (NEI)
National Heart, Lung, and Blood Institute (NHLBI)
National Human Genome Research Institute (NHGRI)
National Institute on Aging (NIA)
National Institute on Alcohol Abuse and Alcoholism (NIAAA)
National Institute of Allergy and Infectious Diseases (NIAID)
National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)
National Institute on Drug Abuse (NIDA)
National Institute on Deafness and Other Communication Disorders (NIDCD)
National Institute of Dental and Craniofacial Research (NIDCR)
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
National Institute of Environmental Health Sciences (NIEHS)
National Institute of General Medical Sciences (NIGMS)*
National Institute of Mental Health (NIMH)
National Institute on Minority Health and Health Disparities (NIMHD)
National Institute of Neurological Disorders and Stroke (NINDS)
National Institute of Nursing Research (NINR)
National Library of Medicine (NLM)

NIH Centers

Clinical Center (CC)[†]
Center for Information Technology (CIT)[†]
Center for Scientific Review (CSR)[†]
Fogarty International Center (FIC)*
National Center for Advancing Translational Sciences (NCATS)*
National Center for Complementary and Integrative Health (NCCIH)

NIH Offices

Office of the Director (OD)

Indicates no intramural program.
[†] *Indicates no grant-making authority.*

APPENDIX III

NUMBER OF SGM-RELATED PROJECTS, BY NIH ICO, FYs 2016–2020

ICO	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
NIMH	85	90	92	98	126
NICHD	49	63	62	55	61
NIAID	49	55	54	52	61
NIDA	74	77	67	62	58
NIMHD	16	27	35	39	51
NIAAA	16	18	22	28	31
NCI	13	18	18	17	21
NIA	7	5	7	12	18
NHLBI	2	2	2	11	16
NIDDK	6	6	6	9	14
NINR	7	6	4	9	13
FIC	2	2	4	7	13
NIGMS	4	3	3	1	4
NIEHS	1	1	2	1	4
OD	2	3	3	3	2
NLM	0	1	1	1	2
NHGRI	0	0	0	2	1
NIDCD	0	1	1	1	1
NCCIH	0	0	0	0	1
NIAMS	0	0	0	0	1
NCATS	0	0	1	0	1
NIBIB	1	1	0	0	0
Total	334	379	384	408	500

APPENDIX IV

SGM RESEARCH FUNDING, BY NIH ICO (EXCLUDING NIAID), FYs 2016–2020

Institute	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
FIC	$437,569	$461,067	$655,891	$1,178,950	$2,480,830
NCATS	—	—	$8,757,478	—	$78,250
NCCIH	—	—	—	—	$168,370
NCI	$8,279,332	$8,464,477	$7,905,839	$13,909,205	$8,134,573
NHGRI	—	—	—	$354,635	$212,500
NHLBI	$932,741	$892,597	$1,284,043	$8,146,375	$10,612,408
NIA	$2,792,329	$2,848,625	$3,513,115	$7,800,079	$9,237,383
NIAAA	$5,020,318	$4,640,697	$6,353,760	$7,718,038	$8,716,238
NIAMS	—	—	—	—	$157,788
NIBIB	$221,250	$265,500	—	—	—
NICHD	$18,057,038	$29,602,401	$27,169,305	$24,490,244	$25,771,034
NIDA	$32,278,080	$30,099,799	$29,762,873	$25,845,455	$28,070,462
NIDCD	—	$97,802	$30,257	$30,749	$179,842
NIDDK	$1,415,141	$1,540,040	$1,776,864	$2,177,743	$2,777,761
NIEHS	$2,015,207	$2,127,583	$2,568,759	$2,088,356	$3,412,689
NIGMS	$4,465,457	$4,919,606	$4,906,869	$640,596	$979,363
NIMH	$26,931,099	$30,643,798	$33,429,012	$38,088,241	$45,252,929
NIMHD	$10,201,837	$14,092,073	$17,219,873	$18,588,261	$20,224,436
NINR	$2,116,894	$2,128,327	$1,655,638	$2,991,475	$4,075,788
NLM	—	$219,102	$173,778	$134,732	$201,653
OD	$781,862	$1,298,752	$655,988	$1,473,786	$1,635,888
Total	**$115,946,154**	**$134,342,246**	**$147,819,342**	**$155,656,920**	**$172,380,185**

APPENDIX V

NUMBER OF NON-HIV/AIDS SGM-RELATED PROJECTS, BY NIH ICO, FYs 2016–2020

ICO	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
NICHD	28	39	42	34	41
NIMHD	8	16	24	23	35
NIAAA	4	7	11	16	17
NIMH	5	9	9	10	15
NIDA	16	18	16	19	14
NCI	7	9	11	10	14
NIDDK	6	6	6	9	14
NIA	5	3	4	9	14
NINR	0	1	2	3	6
NIAID	2	4	4	4	5
NHLBI	2	2	2	3	5
NIGMS	3	3	3	1	4
NIEHS	1	1	2	1	4
FIC	0	0	0	0	4
OD	2	3	3	3	2
NLM	0	1	1	1	2
NIDCD	0	1	1	1	1
NCATS	0	0	1	0	1
NIAMS	0	0	0	0	1
NCCIH	0	0	0	0	1
NHGRI	0	0	0	0	1
NIBIB	1	1	0	0	0
Total	90	124	142	147	201

APPENDIX VI

SGM PROJECTS AS A PERCENTAGE OF ALL NIH PROJECTS, BY SELECTED DISEASE AREAS/HEALTH CONDITIONS, FY 2020
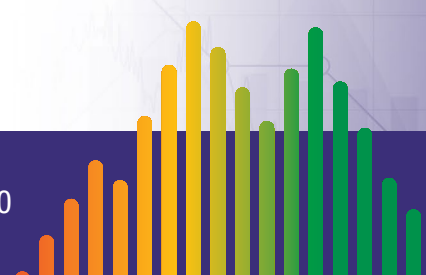
Research, Condition, and Disease	Number of SGM Projects	Total Number of Projects at NIH	SGM as a Percentage of All NIH Projects
Sexually Transmitted Infections	82	798	10.3%
Violence Research	36	392	9.2%
HIV/AIDS	299	3,832	7.8%
Suicide	17	281	6.0%
Mental Health	208	7,389	2.8%
Substance Abuse (Use)	115	4,588	2.5%
Alcoholism, Alcohol Use, and Health	39	1,592	2.4%
Teenage Pregnancy	1	42	2.4%
Contraception/Reproduction	33	1,387	2.4%
Eating Disorders	3	132	2.3%
Depression	15	1,221	1.2%
Tobacco Smoke and Health	7	714	1.0%
Obesity	9	2,635	0.3%
Aging	34	10,086	0.3%
Cancer	34	14,896	0.2%
Dementia	9	4,464	0.2%
Opioids	2	1,155	0.2%
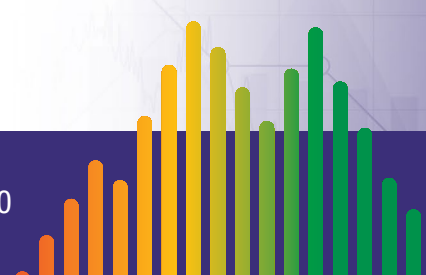
Disease Area/Health Condition	All SGM Funding
HIV/AIDS	$212,855,913
Substance Abuse (Use)	$116,291,072
Mental Health	$83,059,708
Sexually Transmitted Infections	$44,733,758
Cancer	$26,904,257
Aging	$19,271,129
Alcoholism, Alcohol Use, and Health	$18,430,913
Contraception/Reproduction	$14,345,766
Violence Research	$9,931,782
Dementia	$6,985,121
Depression	$4,886,946
Suicide	$4,047,757
Tobacco Smoke and Health	$1,878,694
Obesity	$1,614,048
Eating Disorders	$858,237
Opioids	$461,267
Teenage Pregnancy	$99,616