

A WORD FROM...



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Photo is courtesy of the University of Hawai'i–West O'ahu.

Indigenous Peoples Exist Within Mathematics

When looking at the effects of COVID-19 by race, one is likely to come across a chart depicting the impact on four races: White, Black, Hispanic, and Asian. Often omitted from these charts are the statistics for Indigenous people. When they are included, the data most likely underreports Indigenous people and can be a result of health professionals and others misidentifying Indigenous people as Hispanic, Asian, or another ethnicity. This is especially alarming since, despite the undercount, Indigenous people still have some of the highest death rates.¹

Indigenous refers to the people existing on a land as a community prior to contact with settler populations. An Indigenous person may choose to identify as Indigenous, American Indian, Native American, First Nations, Alaska Native, Native Hawaiian, Chamorro, Samoan, or terms from their Indigenous communities and languages. Since there are Indigenous peoples around the world, we recommend using the inclusive term *Indigenous*.

We, Indigenous people, exist in mathematics, and reporting needs to change to accurately reflect the actual makeup of the mathematics community who are Indigenous. Too often we are relegated to an “asterisk” because our numbers are small. By excluding an entire community from being reported in data, one does not have a baseline to begin change. Potential students may see the data (or lack thereof) and be led to believe that Indigenous people do not belong in the mathematical sciences. This is far from the truth as Indigenous people, like every other society throughout the world, also use mathematics to describe the world around them.

Accurate reporting of Indigenous people matters. In mathematics, the Conference Board of Mathematical Sciences (CBMS) publishes the Survey of Undergraduate Programs every five years. As recently as the 2000 Survey, Indigenous faculty were listed in two categories: “American Indian/Alaskan” and “Asian/Pacific Islander.” While the former category was listed with 0% of full-time math faculty, the latter fared much better, for example, comprising 14% of full-time math faculty at PhD-granting institutions. However, this number is misleading because it groups Asians with Pacific Islanders, a common issue with data collected about these communities,² not to mention that Asian Americans are also underrepresented in math and should be disaggregated from Asians.³

The 2005 and 2010 Surveys introduced new federal categories but also stated that “in the text of this report, some of the more cumbersome federal classifications will be shortened... ‘Native American/Alaskan Native/Native Hawaiian/Pacific Islander’ will be shortened to ‘Other/Unknown.’” This is inaccurate because the shortened version should be “NAAN & NHPI.” The reports later add that when the race and ethnicity of a faculty were unknown, they were listed as “unknown.” In the 2010 Survey, 4% of full-time faculty at PhD mathematics departments were “Other/

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¹J. Bennett-Begaye, S. Clahchischiligi, and C. Trudeau, A broken system: The number of Indigenous people who died from coronavirus may never be known, *High Country News* (June 8, 2021). <https://www.hcn.org/articles/indigenous-affairs-covid19-a-broken-system-the-number-of-indigenous-people-who-died-from-coronavirus-may-never-be-known>

²K. Vaghul, How data disaggregation matters for Asian Americans and Pacific Islanders, *Washington Center for Equitable Growth* (December 14, 2016). <https://equitablegrowth.org/how-data-disaggregation-matters-for-asian-americans-and-pacific-islanders/>

³S. Goel, An Invisible Minority: Asian Americans in Mathematics, *Notices of the AMS* (2006), 878–882.

Unknown.” Without knowing which of these faculty are Indigenous and which are unknown, one may be erroneously led to believe that Indigenous representation within math faculty is on par with the Indigenous population within the total US population. However, looking at the 2015 Survey, we’re finally able to have an accurate understanding of Indigenous faculty representation, with the inclusion of the “American Indian or Alaskan Native (AIAN) and Native Hawaiian or Other Pacific Islander (NHPI)” categories. The 2015 Survey lists 0% AIAN & NHPI for full-time faculty, meaning less than one-half of one percent of full-time faculty were listed as Indigenous.

The CBMS isn’t the only place with incomplete reporting of Indigenous mathematicians. In listing the Science and Engineering Degrees, the National Science Foundation will designate “D” if the number is so low it is suppressed to avoid disclosure of confidential information. The 2008–2018 NSF data on new PhDs contains only 0’s and D’s for American Indian/Alaska Native & Native Hawaiian/Other Pacific Islander.

On the contrary, Indigenous people have long been part of the mathematical community. Edwin Mo’okini and Thomas Storer both earned PhDs in mathematics in 1964, becoming the first Indigenous people to earn such a degree. We also have our own *Hidden Figure*, Mary G. Ross, a Cherokee woman who earned a master’s degree in mathematics in 1938 and worked as the first female engineer at Lockheed. Despite this history, we only know of 21 people in the United States who identify themselves as Indigenous and who have earned a doctoral degree in the mathematical sciences (pure math, applied math, math education, statistics, and biostatistics) as well as 15 graduate students. This small number has made it difficult to build a community, with some in our community going ten years after receiving their PhD before meeting another Indigenous mathematician. Adding to the challenge of building a community, problems with reporting have made it difficult to determine how many of us exist in mathematics.

As mathematical scholars and educators, we enrich the entire mathematical community. However, the onus of creating spaces for Indigenous people should not fall solely on us. If the American Mathematical Society and other mathematics organizations are truly committed to the inclusion and removal of barriers for Indigenous people, they and their members need to share the responsibility of supporting this community. You, a member of the mathematical community, can take steps to achieve this common goal. Below we present a guideline, adapted from those introduced by Indigenous physicists.⁴

Start by learning about the Indigenous people whose ancestral lands you currently live in. The Native Land Digital is a great tool to use.⁵ You can attend events held by your university’s Native American resource center or by a community cultural center.

In the classroom, you can add an inclusion statement in your syllabus about the Indigenous people whose land your university sits on. You may also learn more about Indigenous practices and then incorporate them into lessons with care and consultation, such as what has been done in the Ethnomathematics program at the University of Hawai’i at Mānoa.⁶ Finally, you can share the works of Indigenous mathematicians with your students. You can learn about such mathematicians by visiting www.indigenoumathematicians.org/profiles.

Conference organizers can include an acknowledgment of the Indigenous people on whose land the event is being held. The Society for the Advancement of Chicanos and Native Americans in Science has published a guide to help institutions and organizations in Developing a Land Acknowledgment.⁷ Organizers can also create a cultural advisory committee to have a meaningful relationship with the stewards of the land.

We, Indigenous mathematicians, invite the mathematical community to become an ally and learn more about us by visiting www.indigenoumathematicians.org.

ACKNOWLEDGMENTS. I would like to thank members of Indigenous Mathematicians for their thoughtful comments and suggestions during the writing of this article. This article was inspired by “Indigenous Peoples Exist Within Physics.”⁸

⁴B. Kamai, X. Cid, X. R. Quichocho, A. Little, K. Daniel, C. Gray, ... J. Blue Bird, Indigenous Peoples Exist Within Physics, *Gazette* (2020), 4–9.

⁵<https://native-land.ca/>

⁶<https://coe.hawaii.edu/ethnomath/>

⁷<https://bit.ly/3KW2P0W>

⁸B. Kamai, X. Cid, X. R. Quichocho, A. Little, K. Daniel, C. Gray, ... J. Blue Bird, Indigenous Peoples Exist Within Physics, *Gazette* (2020), 4–9.