FIRST STEPS TOWARD RESPONSIBLE SPACE BEHAVIOR NORMS

PAGE 16

THE NEW SPACE ERA

ABORTION after the Dobbs decision

The U.S. has a MICROCHIP PROBLEM

Implications of CHINA IN THE ARCTIC
1. Lessons from Infection Control During the Pandemic

Policies to prevent the spread of COVID-19 in long-term care facilities have failed to balance community safety and resident well-being. Input from a range of stakeholders highlighted a need for inclusive policy decisionmaking in long-term care.

MORE AT www.rand.org/t/RRA2128-1

2. A Military Demographic Equity Support Tool

To help inject better information into the U.S. Armed Forces’ campaigns to address racial/ethnic and gender disparities, researchers created a decision support tool concept and prototype, which could assist human resources decisionmakers by offering them a better understanding of various policies’ effects.

MORE AT www.rand.org/t/TLA1905-1

3. Securing U.S. Semiconductor Supply Chains

The CHIPS Act is projected to increase U.S. domestic microelectronics manufacturing capacity by more than 1 million wafers per month. But executing on these ambitions could take some time: to staff federal program offices, to solicit proposals from industry and academia, to mature a sufficient workforce, and to construct new fabrication facilities.

MORE AT www.rand.org/b221012

4. Women Veterans’ Access to Reproductive Health Care

In September 2022, senior policy researcher Kayla Williams testified before the U.S. House of Representatives Committee on Veterans’ Affairs.

MORE AT www.rand.org/t/CTA2350-1

5. Update on the Findings of the Intergovernmental Panel on Climate Change (IPCC)

The RAND Climate Resilience Center hosted a webinar to discuss findings from the report of the IPCC Working Group II. The report’s authors assessed the latest science on the interdependence of climate, biodiversity, environment, and human societies.

MORE AT www.rand.org/t/PIA2202-1
16 The New Space Era
The calls for more progress on space governance and responsible space behavior are growing louder.

12 The Microchip Problem
A Chinese attack on Taiwan would imperil the world’s supply of semiconductor components.

14 China’s Arctic Presence
China is seeking to become a significant player in the Arctic and has engaged in economic, scientific, cultural, diplomatic, and military activities in the region.

2 Research Briefly
Out-of-pocket costs for naloxone, and more.

4 Policy Hackathons!
How RAND’s NextGen Initiative helps empower emerging policy leaders through public policy education and other programming.

6 News
RAND turns 75.

7 The Q&A

10 Infographic
Characteristics of active-duty soldiers’ most serious sexual harassment and sexual assault experiences.

20 Giving
An estate gift will support researchers and Pardee RAND students.

Low Earth orbit is the most concentrated area for orbital debris. Photo: NASA Orbital Debris Program Office.
The Cost of a Life-Saving Opioid Antidote Is Out of Reach for Many

A drug called naloxone is at the center of America’s fight to wrest lives from the opioid crisis. “Be prepared. Get naloxone. Save a life,” the U.S. Surgeon General advises. But a RAND study found high prices might be putting naloxone out of reach for many of the people who need it most.

Researchers reviewed more than 700,000 pharmacy claims for naloxone between 2010 and 2018. They found that the average cost declined for most people—but shot up more than 600 percent for people who don’t have health insurance. Overall claims for naloxone climbed sharply over the same time period, but remained close to flat for those without insurance.

That suggests pharmacy prices may pose a significant barrier to getting naloxone into the hands of more people who need it. An estimated one in five nonelderly adults who have an opioid use disorder do not have insurance. That’s nearly 375,000 people.

Naloxone, now often sold as Narcan, a nasal mist, reverses the respiratory effects of an overdose to prevent death. States have passed a flurry of laws in recent years to make it easier to get. Those have mostly lowered legal barriers—for example, allowing pharmacists to dispense naloxone without a prescription—but have not considered financial barriers.

In 2014, researchers found, people with most forms of insurance were paying around $27 out of pocket to fill a naloxone prescription. Those without insurance paid $35.

By 2018, though, the average out-of-pocket cost for people with insurance had fallen to $18. For the uninsured, however, it had peaked at $355 in 2016 before dipping to $250 in 2018.

Pharmacies are not the only places where people can get naloxone; hospitals and community groups also distribute it. But RAND’s findings suggest policymakers could expand access if they focused more on lowering the retail cost. Price subsidies, co-pay limits, or coupons could help more people get naloxone and save a life.
China’s Global Military and Security Influence Is Spreading

Aircraft in Algeria. Missiles in Myanmar. If weapon sales are an indicator of a country’s influence projected around the world, then China has been a generous supplier of influence in recent years.

Researchers at RAND found that China sent weapons and private security contractors to 48 countries between 2018 and 2021. Charted on a map, those exports show China’s expansive influence in Africa especially. Nearly half of the continent’s 54 countries received Chinese weapons, security contractors, or both.

The map also suggests that China is using military exports to counter U.S. influence in its own neighborhood. It provided weapons and security contractors to several countries around the South China Sea, including Indonesia, Thailand, and Laos. But other countries in the region—Vietnam, the Philippines, and Japan—received no such exports. That may signal their security or self-reliance from China.

Laos, in fact, received the second-biggest array of arms from China, after Pakistan, including aircraft, artillery, and air-defense systems. Other countries also received ships and military sensor systems.

Security contractors have followed China’s Belt-and-Road Initiative, a trillion-dollar effort to build influence and markets for Chinese goods through infrastructure projects. Their job is mostly to protect and secure Chinese interests, such as mining facilities, ports, and construction projects. Africa has been a specific focus of Belt-and-Road investments; as of 2020, China was responsible for more construction projects there than the United States, France, and Italy combined.

Its security contractors were working in 29 countries, RAND found. Like the Belt-and-Road Initiative itself, those ranged from Latin America to Eastern Europe and Central Asia to the Middle East and Africa.

U.S. Military Activities in Space Are Perceived As Hostile by China and Russia

A recent RAND report flipped the narrative on 40 years of U.S. space policies and actions, seeking to understand how Russia and China perceived them. The answer, almost without fail, was as aggressive and dangerous provocations.

The researchers identified 10 key events, starting with U.S. efforts to develop a “Star Wars” missile defense program in the 1980s. Then they looked at how Chinese- and Russian-language reports, military journals, and government publications described those events.

They found that both countries were inclined to view U.S. space activities as evidence of an intent to militarize and dominate space. They were especially wary that the U.S. might be trying to threaten their nuclear capabilities from space or develop counterspace capabilities to take out their satellites. They tended to characterize their own—often similar—activities as nonthreatening.

That sense of hostility has only deepened in recent years. In 2006, for example, the U.S. released a new space policy to ensure “unheeded U.S. operations in and through space.” Chinese military authors complained that the U.S. was treating space as “its own unique territory.” Russian writers said it showed the U.S. was prepared to spend as much as necessary to militarize space.

A few years later, the U.S. shot down a defunct U.S. satellite that was tumbling toward Earth with 1,000 pounds of hazardous propellant on board. Both China and Russia saw it as a test of antisatellite missile capabilities.

The U.S., China, and Russia appear to be stuck in an action–reaction cycle, the researchers concluded. Yet even as space gets more congested and contested, there has been surprisingly little open-source analysis of Chinese and Russian perceptions. That’s an oversight, because all sides have used what happens in space as justification for their own continued military activities in space.
Dalton Favors had never given much thought to public policy. One hectic week of data wrangling with the Pardee RAND Graduate School changed that. “It made me rethink what I might want to do for a career,” he said.

Favors is a student at Morehouse College, one of four historically Black colleges and universities that have partnered with Pardee RAND and RAND’s NextGen Initiative to host a “policy hackathon” for two years running. Its purpose is to bring new ideas and new perspectives to hard policy problems—and to introduce a new generation of potential leaders to the field of policy analysis.

The most recent hackathon, held this past fall, focused on policing. Small teams of undergraduate students, working with Pardee RAND graduate students, had one week to identify areas for improvement that could make policing more equitable. Lesson one: Find the story in the numbers.

“I hadn’t understood how powerful data can be, that good data is really a reflection of the life that we live,” said Favors, who is pursuing a double major in Chinese and economics at Morehouse. “It really revolutionized how I think about how public policy can work—or should work.”

A hackathon, just to be clear, has nothing to do with tunneling into computer servers and trying to swipe bank accounts or social security numbers. It’s a timed race to develop something new—a mobile app or computer game, a business idea, a fresh way of thinking about public policy. “It’s pizza and Mountain Dew and a bunch of people in a room trying to build something,” says veteran hackathoner Todd Richmond.

Richmond directs Pardee RAND’s Tech + Narrative Lab, which launched several years ago as a place where the questions students ask are often more important than the answers. Hackathons have been part of its operating code from the beginning. Richmond and his team have used hackathons to prototype new methods for flagging toxic comments on social media and for studying marketplace transactions on the dark web.

The school and the lab started working with professors at Morehouse College in the months after the police killing of George Floyd. What brought them together was a question: What could an educational institution like Pardee RAND do to improve the diversity of the public policy pipeline? The idea that emerged from those early discussions was to not just tell students from historically underrepresented backgrounds about public policy, but to give them a real experience, something they could put on their resumes.

Everyone knew public policy could be easy to overlook amid the recruiting posters for law schools, medical schools, and big Wall Street firms. “There was no voice saying, hey, if you care about these social policy...
issues, there’s a career for you; you can be working in this space,” said Stefanie Howard, Pardee RAND’s associate dean of enrollment and new programs.

The idea found a natural champion in RAND’s NextGen Initiative, a leadership accelerator making connections between emerging policy professionals and RAND’s people and ideas. It and Pardee RAND partnered with three schools in the Atlanta University Center Consortium—Morehouse, Clark Atlanta University, and Spelman College—to make the first policy hackathon happen in 2021. They called it Hacking Equity. A fourth school, Morris Brown College, has since joined them.

The focus that first year was on COVID, and especially on how vulnerable communities had fared during the pandemic. Teams of students from the Atlanta-area schools and Pardee RAND had three weeks to develop a research question, find the data, and tell the story. They were encouraged to draw upon their own experiences and to pursue problems they had seen in their communities.

One team showed how vaccination rates had lagged in historically redlined neighborhoods. Another developed a new way to measure how punitive different state prison systems are, and then used that as a lens to compare COVID outcomes.

“We wanted them to not just understand policy, but to know that they can be the people informing policy,” said Sinead Younge, a psychology professor and director of the Institute for Social Justice Inquiry and Praxis at Morehouse’s Andrew Young Center for Global Leadership. She was a driving force in the early conversations with Pardee RAND that set the hackathon idea into motion. “It was nice to see that lightbulb go on over their heads,” she added.

Hacking Equity 2.0 shifted the focus to criminal justice. Organizers framed it around recent calls to cut spending on law enforcement and reinvest that money in other services. Teams had just one week to crunch their data and look for places where the criminal justice system could be made more equitable and more effective.

For Dalton Favors, that meant hour-long Zoom meetings with his teammates every afternoon, on top of schoolwork. They zeroed in on a historical data set of traffic stops from New Orleans that organizers had supplied to get teams started. They were looking for evidence of quotas, such as an uptick in stops at the end of every month. They found some evidence that police were more likely to stop and cite Black drivers, but it was constant, without the rise and fall that might signify a quota system.

Their main conclusion, though, was that police agencies need to collect more data to give the public a clearer picture of what they do and how they do it. “None of the data showed the race or other information about the police officer,” Favors said. “That’s a huge piece of information you’d want to include. If there’s any bias, you’d want to know: Who is the person giving you the ticket?”

Other teams found that Black Californians are more likely to be stopped and searched, and Hispanic men in California are more likely to get cited. One team found a possible link between income and the likelihood of being stopped. The winning team, which called itself the Justice League, looked at whether shifting funding to improve foster care could reduce crime and prison costs down the road. It found that 19 percent of the people in prison were once in foster care, a much higher percentage than in the overall population.

“There are a lot of people who feel like they have no agency in what goes on in society, in government,” Richmond said. “The idea that students could come together and try to solve a wicked hard problem—that’s powerful. I hope this sparks a little bit of the idea that they are stakeholders in this world, that they can be agents of change.”

When the last data points were graphed and the presentations were done, Younge told the few dozen students who participated she hoped the hackathon had been a transformative step in their education. “Take this experience,” she said, “and run with it.”

Dalton Favors just might. He always thought his career path led toward business. Now he’s thinking public policy research could be a better destination.

“I hadn’t understood how powerful data can be, that good data is really a reflection of the life that we live.”

DALTON FAVORS
In 2023, the RAND Corporation is celebrating its 75th anniversary.

In many respects, the difference between RAND today and the organization that was created in 1948 is substantial and dramatic. RAND began in 1946 as a research project (Project RAND) backed by a single client, the U.S. Army Air Forces. The project was developed at the Douglas Aircraft Company in Santa Monica, California. In 1948, with Ford Foundation support, RAND became an independent, nonprofit research organization. RAND’s early defense-related agenda evolved to encompass such diverse areas as space; economic, social, and political affairs overseas; and the role of government in social and economic problem-solving. RAND now conducts research and analysis for several hundred clients and grantmakers each year.

Through research and analysis that is empirical, nonpartisan, and objective, we strive to make communities throughout the world safer and more secure, healthier and more prosperous.

At RAND, we believe that public policy need not be inaccessible. It is about real people, real places, real organizations, real solutions. We seek to be a reliable source of facts in policy debates and to extend the reach of our findings and recommendations through translations into multiple languages; through engagement at events and conferences; and by making our publications available online, free and accessible to all.

RAND’s work in the public interest seeks to have a lasting positive effect on you, your family, your community, and your world.

Here’s to the next 75!
Abortion After the Dobbs Decision

By Maria Gardner, Staff Writer

When the Supreme Court released its decision in *Dobbs v. Jackson* in June 2022, Americans found themselves living in a country that, for the first time since 1973, did not promise a constitutional right to an abortion.

Some of the implications of this ruling were immediate, with the overturning of *Roe v. Wade* triggering abortion bans or additional restrictions in several states. Other ripple effects, however, will take time to understand as a clearer picture of post-*Roe* America emerges.

We spoke with several researchers at RAND about what the ruling could mean for vulnerable populations like service women and pregnant women with substance use disorders, the whirlwind of misinformation surrounding abortion, and what the policy response might look like.

**Q** Let’s start by talking about reproductive care in the military. Recent RAND research shows that about 40 percent of service women and U.S. Department of Defense civilian women now have either no access or severely restricted access to abortion services where they live or are stationed. What else can research tell us about how much these populations could be affected by new bans and restrictions?

**SM** Perhaps one of the most important things that the Women’s Reproductive Health Survey of Active-Duty Service Members can tell us is the number of active-duty service women who seek abortion care annually. We found that number to be somewhere between 2,600 and 4,100 service women.

The survey also gives us some information on the rate of unintended pregnancies that occur among active-duty service women. An unin-
Tended pregnancy is not the only reason why a woman would seek abortion care. But it is one reason where we know there are policy and behavioral options that could help prevent unintended pregnancies and consequently might reduce the demand for abortion—particularly among women who might be stationed in a state where their access to abortion is severely restricted or completely banned.

For example, comprehensive contraceptive counseling could provide women with information about the full range of contraceptive options. The idea is that service women who are well informed about their reproductive health and their contraceptive options may be less likely to have that unintended pregnancy.

Now, the thing we don’t know is how those abortions are distributed across states. But we do know that there are certain states that have a very large military presence—like Texas, like Florida, like Georgia—that have some of the most-restrictive abortion laws or even outright bans.

What makes service members’ abortion care needs unique?

KH When the Supreme Court decision came down, the majority opinion essentially stated that the right to an abortion should be determined at the state level. First, there’s very little choice for service members as to where they live. And unlike many civilians, service members can’t just travel on a whim to a neighboring state whenever they want to—you actually have to be approved to travel.

Another reason service members are uniquely impacted is the type of jobs that they’re often required to do. Service members—particularly junior service members—often can’t perform their job duties while pregnant, especially if they’re in a job that’s very physically demanding like working in an aircraft or on a ship.

Finally, because of the Hyde Amendment, TRICARE—the health care program for active-duty service members and their families—restricts the types of abortions covered by insurance, which is different than some civilian insurance plans. So, it’s less likely that insurance would cover abortion care that’s needed.

SM In one paper, Kyleanne and I wrote about a hypothetical scenario in which a junior enlisted woman who is stationed in Texas would need to travel to Kansas, which is the closest place she could get an abortion post-Roe. If you add up travel time, hotels, and gas prices—the cost is now over half her monthly salary.

On top of that, she needs to ask for permission to leave. She may not be feeling 100 percent physically immediately after this procedure, and so there may be duty restrictions that she has to deal with. There is a lot of thought and effort that service women will have to put in to be able to receive this health care.

KH That said, in October 2022, the Department of Defense responded to the ruling by committing to update military policies to protect service members’ access to reproductive care, including abortion.

Another group likely to be disproportionately affected is pregnant women with substance use disorders (SUDs). What makes this group particularly vulnerable?

LF Pregnant women with SUDs are twice as likely to have chronic medical problems as pregnant women without SUDs. That makes pregnancy riskier, both for them and for their fetuses. There are also much higher rates of unintended pregnancy among women with SUDs than among women in the general population—about nine out of 10 pregnancies compared with one out of two.

While they’re pregnant, people with SUDs also have a higher risk of severe maternal morbidity and even death around the time of childbirth. Then, in the first year after birth, they’re at high risk of dying from opioid overdose during that very vulnerable period.

From the preconception period to the postpartum period, it’s a really challenging time for these women. Women with SUDs need more care, more support, more access to prenatal care and postpartum supports, and more evidence-based substance use disorder treatment. When you limit reproductive choice for these women, it does the exact opposite.
Abortion bans that arise from the Dobbs decision could make it even more challenging for this already stigmatized group to feel comfortable seeking treatment for their SUDs, regardless of the decision they end up making about their pregnancy.

Research has shown that punitive policies have been found to deter women from prenatal care and substance use disorder treatment. What implications could this have for women after the Dobbs decision?

**LF** Punitive responses to substance use in pregnancy reflect the view that substance use somehow is a choice or a moral failing, rather than a chronic medical condition.

Over the past couple of decades, more and more states are adopting these punitive policies. For instance, in 2000, 12 states considered substance use in pregnancy to be child abuse, neglect, grounds for civil commitment, or a criminal act. Now, that number has more than doubled, so a total of 28 states, plus D.C. So, you can see that there’s this momentum around punishing women for this chronic relapsing-remitting condition while they are pregnant.

Now, the expert consensus from more than 20 medical and public health organizations is that these punitive policies are going to discourage women from seeking necessary care, both for their pregnancy and for their behavioral health, as well as any other health conditions they might have.

The Dobbs ruling is just another example of a policy that limits access to care for women and people with capacity for pregnancy, and punishing them further has the potential to worsen the stigma that they already experience. It can make it harder for clinicians like me who take care of families affected by substance use to form and maintain a trusting patient–provider relationship.

Imagine for a moment a woman with a substance use disorder who is having a miscarriage—which is unfortunately a common outcome across all pregnancies. As my colleagues and I wrote about recently, the worry is that they could be doubly policed and therefore doubly punished if the pregnancy loss was assumed to be both intentional and perhaps caused by their substance use.

Even before the Dobbs decision, we know that the topic of abortion has long been subject to misinformation. What does abortion misinformation look like in practice?

**JR** One of the most common forms of abortion misinformation happens through crisis pregnancy centers, which often deploy deceptive tactics and present limited, extremely biased, or even in some ways unscientific or inaccurate health information. These centers tend to access individuals when they’re at a vulnerable point in their decisionmaking process. In fact, there are more crisis pregnancy centers than there are abortion clinics in the U.S.

Another place we’re seeing misinformation is when providers in certain states are required to present patients with consent forms that can include biased and inaccurate medical information. This can range from suggesting there’s a link between abortion and breast cancer to inaccurate descriptions of certain physical features or functions at different gestational ages.

When your provider—someone who is often seen as a trusted source—is being required to share information that is not medically accurate, that is certainly problematic. It’s an environment that makes it really tough for people to be able to make decisions around their medical care and is also very challenging for providers.

How might the Dobbs ruling affect this misinformation landscape?

**JR** Before the Dobbs decision, the right to an abortion was protected federally. By moving it entirely to the states, it creates an environment where information could be different depending on where you live. Thus, where there are many different sources of information, there’s more opportunity for misinformation within each of those ecosystems, and it becomes that much harder to contain. Misinformation around legality also becomes much harder to grasp, not only because laws vary by state in terms of potential bans, gestational limits, etc., but also because the landscape is rapidly changing.

As we talk about solutions, we also need to be more aware of groups being left out. For example, we’re hearing about the role large employers can play in facilitating access to abortion and making coverage policies clear. But what about individuals who are unemployed? They’re being left out of the conversation.

In general, there are large disparities in access to information about abortion services. For example, we recently wrote about the fact that those who might receive an abortion via telemedicine are those who have used telemedicine for other reasons in the past, and those people tend to be wealthier and more educated and thus less likely to face barriers to accessing abortion care. So, we need to think about what communities are being disproportionately affected and then think about how to get accurate information to everyone.

Punitive responses to substance use in pregnancy reflect the view that substance use somehow is a choice or a moral failing, rather than a chronic medical condition.

**LAURA FAHERTY**
**SEXUAL HARASSMENT**

**WOMEN**

- **Most common behaviors for sexual harassment:** attempts to establish an unwanted relationship, upsetting discussions about sex, offensive sexual jokes, repeated sexual comments about appearance, and gender discrimination (i.e., being mistreated, insulted, or ignored because of gender and told either that women should not have their jobs or that men are better at their jobs)

- **Sexual harassment behaviors commonly co-occur:** on average, women experience 3.2 behaviors at one time

**MEN**

- **Most common behaviors for sexual harassment:** told they did not act like a man, upsetting discussions about sex, exposed to offensive sexual jokes

- **Sexual harassment behaviors commonly co-occur:** on average, men experience 2.3 behaviors at one time

**FREQUENCY AND PERPETRATOR CHARACTERISTICS**

**WOMEN**

- **Frequency:** occurred more than once
- **Number:** more than one perpetrator
- **Gender:** all men
- **Military status:** at least one perpetrator in the military
- **Rank relative to respondent:** military peer, supervisor, or in chain of command

**MEN**

- **Frequency:** occurred more than once
- **Number:** more than one perpetrator
- **Gender:** all men
- **Military status:** at least one perpetrator in the military
- **Rank relative to respondent:** military peer, supervisor, or in chain of command

**WHEN AND WHERE EVENT OCCURRED**

For both men and women, experiences occurred during required military activity, at a military installation, at work during duty hours.

For both men and women, there are few differences in respondents’ experiences between high-risk and non–high-risk installations or between only high-risk installations, where risk is above the average for the Army overall.
POLICY IMPLICATIONS

Prevention efforts should emphasize the most common behaviors and scenarios experienced by soldiers.

- For sexual harassment, these include gender discrimination; persistent or offensive discussion and jokes about sex; repeated attempts to establish an unwanted romantic or sexual relationship; and insults related to men’s masculinity, sexual orientation, or gender expression.

- For sexual assault, training should be aligned with victims’ experiences and emphasize common scenarios across all victims.
  - Current materials focus heavily on heterosexual women as sexual assault victims.
  - There is a need for greater representation of men, sexual minorities, and other soldiers’ experiences.

- For both sexual harassment and sexual assault, there is no need to tailor content for high-risk installations.

Limits on data collection about sexual orientation are intended to protect privacy—but may limit the Army’s ability to prevent sexual assault. Pursuing opportunities to change U.S. Department of Defense policies would allow detailed data collection on sexual minority soldiers’ experiences with assault, harassment, and discrimination to inform prevention efforts.

SEXUAL ASSAULT

Women are more likely than men to

- experience completed or attempted penetrative sexual assault
- describe the assault as sexually motivated
- be incapacitated at the time of the assault
- describe the perpetrator as a friend or acquaintance
- be assaulted in private
- have been drinking at the time of the assault
- have a perpetrator who was drinking at the time of the assault

Men are more likely than women to

- indicate that the perpetrator’s intent was to abuse or humiliate them
- be assaulted by more than one person
- be assaulted by at least one woman
- be assaulted by an officer or a subordinate
- be assaulted during required military activities
- be assaulted at work, during duty hours
- describe the assault as hazing

There are few significant and substantively meaningful differences between high-risk and non–high-risk installations, where risk is above the average for the Army overall for either men or women.

Heterosexual women are most likely to

- be made to touch private areas of the perpetrator’s or someone else’s body
- be assaulted by men only

LGBTQ women are most likely to

- be assaulted at a military installation
- be assaulted while being intimate with the perpetrator

Women who do not report their sexual orientation (PNA/NR) are most likely to

- indicate that the perpetrator’s intent was to abuse or humiliate them
- describe the assault as bullying

Heterosexual men are more likely than LGBTQ and PNA/NR men to

- have at least one service member as the perpetrator(s)
- be assaulted by women only

LGBTQ and PNA/NR men are more likely than heterosexual men to

- experience penetrative or attempted penetrative assaults
- have a perpetrator who was their superior, a higher-ranking member of their chain of command (but not a supervisor), or a stranger
- be assaulted during training, an official military function, or temporary duty
- be drinking, drugged, or unaware of whether they had been drugged at the time of the assault
- describe the assault as hazing or bullying

SEXUAL ORIENTATION GROUPS

- Heterosexual
- LGBTQ = lesbian, gay, bisexual, or other
- PNA/NR = prefer not to answer or no response

For women, there are enough cases of sexual assault in the data to create three groups. Men, however, could be sorted into only two groups: heterosexual versus all others (i.e., LGBTQ + PNA/NR).

It is important to keep in mind that the actual sexual orientations within the PNA/NR group are unknown, and some of the NR group is simply respondents dropping off the survey before completion.

LIMITATIONS

- Respondents may or may not have officially reported their experiences.
- If investigated, these experiences may or may not meet the Military Equal Opportunity definition of sexual harassment and gender discrimination or the Uniform Code of Military Justice definition of sexual assault.
- The focus is on the most serious event as defined by respondents, not all sexual harassment, gender discrimination, or sexual assault experiences.

Adapted from Sexual Harassment and Gender Discrimination in the Active-Component Army: Variation in Most Serious Event Characteristics by Gender and Installation Risk by Avery Calkins, Matthew Cefalu, Terry L. Schell, Linda Cottrell, Sarah O. Meadows, and Rebecca Collins, 2021 (www.rand.org/t/RRA1385-1), and Sexual Assault Experiences in the Active-Component Army: Variation by Year, Gender, Sexual Orientation, and Installation Risk Level by Avery Calkins, Matthew Cefalu, Terry L. Schell, Linda Cottrell, Sarah O. Meadows, and Rebecca Collins, 2022 (www.rand.org/t/RRA1385-2).
The U.S. Has a Microchip Problem. Safeguarding Taiwan Is the Solution.

A Chinese attack on the island would imperil the world’s supply of semiconductor components. Here’s how to offset that threat.

By Jason Matheny

Taiwan’s domination of the microchip industry has been a boon to the global economy, but it now presents an acute challenge. Taiwan today manufactures most of the world’s microchips, which are in practically everything: cars, coffeemakers, combine harvesters. The whole world hums with microelectronic components—including about 92 percent of all advanced microchips—that are made largely in a handful of factories on an island less than one-tenth the size of California. Little more than 100 miles away across a strait lies mainland China, which views Taiwan as a breakaway region and has vowed to bring it back under its control.

Were China to seize Taiwan, one of two things could happen to the chip supply: The microchip factories could end up being controlled by China, or they could be destroyed in a conflict. Either way, a global catastrophe would ensue. In the first scenario, China could decide to limit access for the U.S. and its allies to advanced chips, significantly reducing American technological, economic, and military advantages. But if the second scenario came to pass, the world could experience an economic crisis the likes of which we have not seen since the Great Depression.

Luckily, Taiwan is now watching and learning from Ukraine’s...
resistance to Russia’s invasion. And the lessons Taiwan is taking from that conflict suggest how the U.S. can help Taipei—and itself—avoid either dire outcome.

One of the island’s major manufacturers is Taiwan Semiconductor Manufacturing Company Limited (TSMC). An enterprise founded in 1987 through a government initiative, it now makes many of the world’s most essential microchips for NVIDIA, Qualcomm, Apple, and thousands of other companies. Thirty-five years ago, when TSMC’s foundries were just getting started, the U.S. firm Intel made about 65 percent of the world’s advanced chips. Today Intel controls less than 10 percent, while TSMC’s share is 53 percent.

To see why this matters, look no further than the U.S. auto industry, which forecast an estimated $210 billion in lost revenue last year after factory slowdowns caused by the pandemic led to bottlenecks in the supply chain for automobile chips. In the event of a conflict with China, the destruction of Taiwan’s microchip manufacturing would mean not a slowdown or a bottleneck but a sudden and complete stop of nearly two-thirds of the world’s supply for the industries that depend on it. One view about the risks associated with Taiwan’s near-monopoly in microchip manufacturing in the face of a looming, belligerent China is that it is still, in essence, a supply-chain problem. Therefore, the best way out of this potential catastrophe is to build up production elsewhere, including in the U.S. The recently passed bipartisan CHIPS Act, which will fund programs worth $53 billion, is explicit in its aim “to develop onshore domestic manufacturing of semiconductors critical to U.S. competitiveness and national security.”

Another position on Taiwan is that this issue is a strategic military problem, and the best way to respond to an invasion by China would be for the U.S. to leap to Taiwan’s defense. President Joe Biden expressed this view when asked, in a recent interview on 60 Minutes, if U.S. forces would defend the island. “Yes,” he said, “if, in fact, there was an unprecedented attack.”

The problem with these approaches is that they both, in their different ways, misapprehend the significance of time. The idea of replacing microchip imports with American-made products undervalues Taiwan’s 40-year head start with its microchip industry—and it took at least a decade for the island to become globally competitive. A similar lag will apply to the U.S., which will probably need several decades at least of further investments of the same scale as the CHIPS Act before it can manufacture domestically most of the microchips it requires.

An additional complication is that TSMC’s operations have features that are hard to imagine replicating elsewhere. Its advanced-research division, for example, has engineers working in three shifts so that it can run 24 hours a day, seven days a week—“the Nightingale Army,” as they’re sometimes known, who are sacrificing themselves for this national purpose, Taiwan’s “silicon shield.”

The time issue with the idea of leaping to Taiwan’s defense is that if China attacks, it could be too late. Should China invade, the coastal-based microchip factories could be destroyed by the time the U.S. military responded. The world would already be well on its way to plunging off an economic cliff.

The U.S. does have a third option: make it too costly for China to invade Taiwan by enabling Taiwan to defend itself. Late last year, the Biden administration initiated a $1.1 billion arms sale to Taiwan. The package included antiship and air-to-air missiles, as well as an estimated $665 million to support Taiwan’s surveillance-radar program. But Taiwan probably needs more defenses to credibly deter an invasion.

Taiwan has an unfortunate history of spending too much of its limited defense budget on expensive platforms such as fighter aircraft and surface ships—neither of which are likely to survive the first days of a war with China. Some of the same types of arms that the U.S. has agreed to sell to Taiwan are currently in use by Ukrainians in their defensive war against Russia.

Even better, these sorts of systems—such as the High Mobility Artillery Rocket System (HIMARS), drones, loitering munitions, antitank missiles, and sea mines—might be able to do the job at relatively low cost. For about a tenth of the investment of the CHIPS Act, Taiwan could build up a so-called porcupine defense with a “large number of small things.”

Such a strategy, already proving successful in Ukraine, could yield results within a couple of years, rather than decades. One holdup in the process of arming Taiwan as quickly as America might like is a bottleneck in U.S. arms manufacturing caused by—you guessed it—microchips. The problem is temporary, but it only goes to underline what a priority it is for the U.S. to ensure that Taiwan has the right defense systems to project its own security, in the most timely way possible.

A version of this commentary originally appeared on theatlantic.com in October 2022. Commentary gives RAND researchers a platform to convey insights based on their professional expertise and often on their peer-reviewed research and analysis.
China’s Presence in the Arctic

By Doug Irving, Staff Writer

A Coast Guard cutter spotted the ships during a routine patrol of the Bering Sea, north of Alaska: a guided missile cruiser and two smaller ships from China, traveling in formation with four ships from Russia. The cutter followed until they split up and dispersed.

The ships broke no rules and violated no boundaries. But their appearance so close to the Arctic this past fall raised concern in Washington nonetheless. For years, China has worked to establish footholds in the region that would give it access to rich mineral deposits and shipping lanes, as well as a greater say in Arctic affairs. That—and a strategic presence in a region ringed by the United States and several other NATO countries.

Researchers at RAND and the Swedish Defence Research Agency looked at where China is operating in the Arctic, what it wants, and what that could mean for regional security. They concluded that China has made only limited inroads in the Arctic, but that’s not for lack of trying.

“The threat should not be inflated,” said Stephanie Pezard, a senior political scientist at RAND who specializes in Arctic security. “But at the same time, they have a clear intent to not be excluded from Arctic developments as the region becomes more accessible. The real questions are, How much of a role do they want, and what does that mean for an Arctic nation like the United States?”
Conditions in the Arctic have always been so extreme, the distances so vast, that even rivals like the United States and Russia were forced to cooperate there. But the Arctic is warming faster than anywhere else on the planet. Sea routes that sailors and explorers have dreamed about for centuries are starting to open. The promise of Arctic riches—oil, minerals, trade routes, even fish—has started to draw interest from far outside the northern latitudes.

China has declared itself a “near-Arctic state,” a designation it invented to push for a greater role in Arctic governance. It has dispatched research expeditions, sought to establish mining and gas operations, and envisioned a network of shipping routes crossing the Arctic, a “silk road on ice.” It describes itself as an “active participant, builder, and contributor in Arctic affairs,” one that has “spared no efforts to contribute its wisdom to the development of the Arctic region.”

But in the Arctic, as in the rest of the world, the United States sees China as a potentially destabilizing force, with the economic and military power to try to bend the established order to its liking. The Pentagon considers China its “pacing challenge” of the foreseeable future. Its Arctic strategy, released in October, pays particular attention to the risk of China using commercial or scientific access to the Arctic for military advantage.

Researchers at RAND set out to document known Chinese activities in the North American Arctic, which touches Alaska, Canada, and Greenland. Their counterparts in Sweden focused on the European side, from Iceland, through the Nordic countries, to Russia.

What they found: Especially in the North American Arctic, “there’s not a ton going on,” Pezard said. China has invested in a handful of mining operations, mostly chasing valuable rare earth minerals. It has trade partnerships with Greenland and a small stake in a zinc mine in Alaska. A Chinese company tried to buy a shuttered U.S. Navy base in Greenland, but the Danish government quashed the idea.

China has used loans and infrastructure deals to prop open the door for itself in countries across Asia, Africa, and Latin America. But the countries of the North American Arctic have generally taken a hard look at any proposed Chinese investments—and often a hard pass. Canada blocked a $150 million gold mine deal that would have put Chinese interests too close to military installations. Greenland has held up plans for another Chinese mine over concerns about pollution.

“We didn’t see the more nefarious activities that we’ve seen in other parts of the world, like predatory lending or influence over local decisions, that are more damaging to international norms,” said Stephen Flanagan, an adjunct senior fellow at RAND and former senior director for defense policy and strategy at the U.S. National Security Council. “All of the governments are being careful in how they deal with China. It’s a ‘buyer beware’ approach.”

RAND’s study did not include the Russian side of the Arctic. That may be China’s best route to greater Arctic influence. The Arctic Council, a governing body of Arctic States and indigenous nations, suspended its meetings last year, refusing to engage with Russia after it attacked Ukraine. A panel of experts that RAND convened for its study noted that Russia could seek to form its own Arctic governing council, with a more central role for its ally, China.

The experts thought that was possible, but not necessarily probable. Despite its joint operation in the Bering Sea this past fall, and codvelopment of a natural gas project in the Russian Arctic, Moscow has also been wary of letting China pursue its ambitions so close to its home shores. And rather than walk away from the existing council, Russia has called for it to resume its meetings, with Russia back at the table.

For now, the U.S. should continue to make the Arctic a diplomatic, economic, and strategic priority, to demonstrate its commitment to the region and its people, researchers concluded. It should work to strengthen solidarity among its Arctic allies—and explore conditions under which it could restart some engagement with Russia, such as on search-and-rescue preparedness.

But the U.S. should also recognize that engaging with China in the Arctic does not have to be a win-or-lose proposition. There are opportunities to cooperate—on climate change, for example, or pollution control. China has already played a key role in international agreements to protect Arctic fisheries and to create maritime shipping regulations. On paper, at least, both China and the United States are committed to ensuring the Arctic remains a region of peace and stability.

The next few years will be a crucial test. If current projections hold, the Arctic could see its first ice-free summer by 2030.

China’s Strategy and Activities in the Arctic: Implications for North American and Transatlantic Security is available for free download.
In this New Space Era, the international community needs to address the inadequacies of the current system of space governance.
A missile lifted off from a base in northwest Russia on a November morning in 2021. It hit its target several minutes later: a dead Russian satellite that had been orbiting uselessly since the 1980s. The Russian minister of defense applauded the precision of the missile test as “worthy of a goldsmith.”

But the satellite didn’t just vanish. It blew into hundreds of pieces of debris—solar panels, antennas, chunks of metal—that were now whipping around the Earth at thousands of miles per hour. NASA woke the astronauts on the International Space Station and told them to evacuate into their docked space capsules as the debris shot past. At last count, several hundred trackable pieces of that satellite were still in orbit.

Space may seem infinite, but the narrow band that hugs the Earth, where satellites and space stations operate, is not. A recent RAND study described it as congested, contested, and littered with debris. Tens of thousands of additional satellites are scheduled to launch in the next few years, the vanguard of a new space era. Existing space treaties won’t be enough to keep them safe, to prevent crowding and collisions, and to preserve the promise of outer space.

“If you don’t have some kind of global governance framework, if you can’t prevent satellites from running into each other, then it all becomes pretty pointless pretty quickly,” said Katie Feistel, an assistant policy researcher at RAND. “There is such opportunity in space. The potential benefits are huge. But only if we keep space sustainable.”

RAND anticipated the dawn of the space age with its first report, *Preliminary Design of an Experimental World-Circling Spaceship*, released 11 years before *Sputnik*. It has produced more than 1,000 reports on space and space policy in the 75 years since then. It recently launched the RAND Space Enterprise Initiative to pull together research and expertise on space strategy, operations, and challenges—starting with space governance.

There are no international laws against blowing up a satellite and putting a space station at risk. There are, instead, a handful of treaties and agreements meant to encourage good behavior and cooperation in space. None of them have any enforcement mechanisms, and their language is so vague that even “outer space” has no clear definition. They were drawn up in the 1960s and 1970s, in part to prevent the United States and the Soviet Union from taking their nuclear arms race into space.

Space has since become one of the great enablers of modern life, even if people don’t often look up and think of it that way. Satellites allow us to monitor the escalating effects of climate change. They provide internet service to cut-off communities. They help synchronize electric grids, timestamp financial transactions, and keep trains and cargo ships on schedule. A front-line commander in Ukraine told *The Washington Post* that trying to fight without satellite support would be like trying to fight without a gun.

Hundreds of thousands of objects already share Earth’s orbit, from shards of debris no bigger than a screw to satellites the size of a school bus. And at orbital speeds, there are no fender benders. NASA once had to replace several space shuttle windows that had been damaged in orbit. It determined the damage had been caused by flecks of paint, traveling at up to 17,500 miles per hour.

“There’s a lot that is happening in space right now, a lot of potential for mishaps,” said Bruce McClintock, an astronautical engineer, military strategist, and former test pilot, now a senior policy researcher at RAND and director of the Space Enterprise Initiative.
Initiative. “We need to embrace this opportunity to be thoughtful and strategic about humanity’s role in space. It shouldn’t take a catastrophe before we solve the problem.”

The United Nations has convened a working group to explore possible solutions. Major space powers like the United States, Russia, and China have voiced some support for stronger measures. The U.S. and others, for example, have called for a moratorium on antisatellite missile tests. That’s a good start, RAND researchers concluded—but any system of space governance will ultimately need hard-and-fast rules and a way to enforce them.

Their recent study lays out a possible path forward. That could start with the major powers acknowledging the existence and locations of all of their satellites—which amateur astronomers have been tracking for years anyway. That would start to build trust and confidence among nations in space. It also could bolster the creation of a single, international system to track and route satellites, an air traffic control for orbital space.

Such a system would enable much better awareness and communication than exists today. A few years ago, a European satellite was on a potential collision course with a private SpaceX satellite. With no international guidelines for how to handle such a situation, the Europeans sent SpaceX an email. Receiving no response because of a computer glitch, they chose to shift their satellite to another orbit, a costly and wasteful maneuver, but one that prevented a collision.

Earth also needs to reduce the amount of junk and debris it leaves in orbit. There have been attempts to mitigate debris; RAND participated in one effort to brainstorm solutions aptly named the “Catcher’s Mitt study.” But plans to clean up Earth’s orbit have too often broken down because of the tremendous lack of trust among spacefaring nations. Without better communication, it would be hard to distinguish a satellite zipping around to collect debris from one zipping around to threaten or spy on a rival’s satellites.

The risk of so many satellites operating amid so much debris with so little governance has been apparent for decades. A 1978 study showed how collisions between satellites in a crowded orbit would create fragments that would eventually hit other satellites. That would generate more fragments, which would endanger more satellites. The end result, it warned, could be a “ring system” of debris circling the Earth, “similar to that around Saturn.”

Sometime soon, RAND researchers concluded, the countries of the world are going to have to agree on verifiable, enforceable rules of behavior in space. They could start by offering benefits to those who comply, rather than sticks for those who don’t. That could look like airline safety ratings, providing a reputational boost and greater opportunities for countries that meet basic standards of good behavior. Or it could come with tax incentives or lower insurance rates, like a safe-driver discount.

“Nobody owns space—there are no territories, there are no borders—so it’s going to require all sovereign states to come together and figure out how to manage it,” said Douglas Ligor, a senior behavioral and social scientist at RAND and a former attorney for the departments of Homeland Security, Justice, and Commerce.

“We’ve done it before,” he added. “A lot of people scoffed at the idea that the U.S. and the Soviet Union could sit down and come up with space treaties on top of arms control treaties. It can be done; it has been done.”

One good place to start: the open ocean. Centuries of debate, diplomacy, competition, and conflict have forged a system of laws and standards for the high seas. That system ensures the safe passage of ships from all nations, sets forth roles and responsibilities, and seeks to preserve the high seas as a shared resource, a global commons. Crucially, it also has an international tribunal to uphold the laws and settle any disputes.

That could provide an early model for managing space, Ligor said—with some obvious differences. “Nobody cares if a sailor drops a wrench in the middle of the ocean,” he said. “If an astronaut drops a wrench, it becomes an uncontrollable projectile, traveling at thousands of miles per hour, that will destroy anything in its path.”
Fly Me to the Moon

Space, 2050: There are mining colonies on the moon and tourist resorts floating in Earth’s orbit. People play sports in space, generate power in space, even grow expensive, trendy coffee beans in space.

That’s not entirely science fiction. Researchers at RAND Europe looked at how trends in more than a dozen economic sectors could play out in space between now and 2050. They found it would not take huge technological breakthroughs to make space and space travel a much bigger part of everyday life. Instead, it would take a steady progression of incremental advances—and one development in particular could provide the tipping point.

The cost to launch people and payloads into space has dropped in recent years. It still costs thousands of dollars per kilogram to get to orbit—but that could fall to tens of dollars by 2040. At that point, cost would not be what holds back the economic development of outer space.

The researchers didn’t have to make any wild predictions about what would come next. They relied, instead, on official projections of what space could look like in the coming decades from government, military, industrial, and academic sources.

It could start with a race to mine precious elements from asteroids or the moon. That could happen within the next decade, touching off what experts already predict will be the “Gold Rush of the 21st century.”

Long-term mining operations would require regular transportation, supply, and repair services. Those, in turn, could also support the development of factories in outer space—where air pollution wouldn’t be a concern. Large-scale mining and manufacturing enterprises would need new sources of power. That could further energize efforts by the United States and several other countries to develop space-based solar farms to generate clean energy and deliver it with microwave or laser transmitters.

All of that would require more people to spend more time in outer space. It would not be a giant leap for hotels to make space a tourist destination. If those take off, new forms of transportation could follow—magnetic space trains, for example, running from resort to resort or factory to factory.

By then, space might be a prized location for filming, an arena for extreme sports. Space-based agriculture would at first be necessary to support lunar mining colonies or factories. But it would quickly turn out novelty products for sale down on Earth, such as that space-grown coffee.

Cost, of course, is not the only thing keeping people from spending their spring break in orbit. Spaceflight would have to be seen as safe and reliable, every time. The international community would also have to work out some difficult legal and regulatory questions. Who, for example, has the right to lunar resources? Who has jurisdiction when a crime gets committed in orbit?

The RAND Europe study was meant to provide an overview of what might happen in space in the next three decades—not what should happen, or what will. The UK Space Agency sponsored the study to identify possible high-risk, high-reward opportunities as it develops the UK’s national space strategy.

Predicting the future of space, the researchers acknowledged, has a long history. “Certainly, many of the visions of today for how space may look out to 2050,” they wrote, “do not differ too radically from the ideas put forward by physicists, astronomers, and science fiction writers in the late 19th or early and mid-20th centuries.”
Giving

An estate gift from RAND leader Natalie Crawford will support researchers and Pardee RAND graduate students.

“I’ve worked at RAND during a significant portion of its 75 years and have great regard for its people, its work, its mission, and the research it continues to produce.”

NATALIE CRAWFORD

first heard of RAND when I was 15 years old. I didn’t know exactly what it was or what it did, but I knew smart people worked there addressing hard problems. I just knew RAND was the place I wanted to work,” said Natalie Crawford, senior fellow and distinguished chair in Air and Space Policy at RAND and a professor at the Pardee RAND Graduate School.

Crawford got the chance in February 1964 when she joined RAND as an analyst in the Armament Group of the Aero-Astro Department. She’s been with the organization since then, serving in many leadership roles, including as vice president and director of RAND Project AIR FORCE. Now, almost 60 years later, Crawford continues to make significant contributions to RAND and to give back, most recently with an estate gift.

Crawford’s gift of property will establish two funds at RAND in the name of Natalie and Robert Crawford, her late husband. One fund will support RAND researchers in extending the reach, influence, and impact of research projects. The other will establish a scholarship to support students at Pardee RAND pursuing a degree with an emphasis on applied technology.

“Natalie Crawford has always worked tirelessly to support RAND’s people and purpose. In addition to her contributions to national security, aerospace science, and technology, she serves as a mentor and advisor within RAND and Pardee RAND and has led the RAND Alumni Association—a forum for engagement among current and former RAND staff members—since 2009,” said Brandon Baker, vice president of development at RAND. “With this gift, she not only cements her RAND legacy but helps provide RAND with a financial foundation for the future.”

Legacy gifts like Crawford’s, which is part of RAND’s $400 million Tomorrow Demands Today fundraising campaign, include traditional estate bequests, as well as directed benefits from life insurance or retirement plans. They come with tax benefits and membership in the RAND Legacy Society, which recognizes those who have made a planned gift to benefit RAND or Pardee RAND.

“I’ve worked at RAND during a significant portion of its 75 years and have great regard for its people, its work, its mission, and the research it continues to produce,” Crawford said. “RAND remains very important to me.”
SUBSCRIBE TO POLICY CURRENTS, RAND’S FLAGSHIP NEWSLETTER AND PODCAST

Insights from the world’s premier nonpartisan think tank.

In your inbox or your earbuds.

rand.org/policycurrents
TOMORROW

PHILANTHROPIC CONTRIBUTIONS SUPPORT OUR ABILITY TO TAKE THE LONG VIEW, TACKLE TOUGH AND OFTEN-CONTROVERSIAL TOPICS, AND SHARE OUR FINDINGS IN INNOVATIVE AND COMPPELLING WAYS.

campaign.rand.org
campaign.rand.org/pardee-rand