

Research Steps Forward to Meet an Unprecedented Challenge

Director's Letter

The strength of an organization can often be measured by its ability to adapt quickly to changing circumstances. In 2020, the Division of Research, along with the rest of the world, found itself facing a global pandemic that prompted our investigators and their staffs to reshape their work and personal lives. We were able to extend our significant intellectual resources and quickly position ourselves at the forefront of the national effort to understand and fight COVID-19.

Our work started early with observational studies, including one in [JAMA](#) led by Research Scientist [Laura C. Myers, MD, MPH](#), showing the virus impacted patients of all ages. That was followed by studies led by [Matthew Solomon, MD, PhD](#), [Mai N. Nguyen-Huynh, MD](#), and [Betty Suh-Burgmann, MD](#), showing how the pandemic affected heart attack and stroke patients and [endometrial](#) cancer diagnoses – all reflecting the ways in which fear of contracting COVID-19 was keeping patients from seeking treatment when they most needed it.

The early months of the pandemic also led to a flurry of research ideas and proposals, leading to the creation of the [COVID-19 Clinical Research Coordinating Team \(CCRCT\)](#), a panel designed to evaluate the many promising ideas. The panel reviewed more than 200 proposals, dozens of which went on to be approved and put into action.

It was also important to know what was happening to patients with COVID-19 who entered the health care system. With support from The Permanente Medical Group, Research Scientists [Gabriel Escobar, MD](#), and [Vincent Liu, MD, MS](#), looked at [operational aspects](#), using predictive analytics to determine which patients might need hospitalization. They are also completing one of the most comprehensive evaluations of how race and ethnicity are associated with COVID-19 testing, infection, and patient outcomes, including hospitalization and mortality.

By spring 2020, our physicians and researchers had begun participating in a number of clinical trials led by [Jacek Skarbinski, MD](#), a newly-appointed DOR research scientist, and [Alan Go, MD](#), regional director of the [KPNC Clinical Trials Program](#). They quickly set up several studies to look at remdesivir and selinexor, among other treatment options.

That was quickly followed by participation in a global effort to find a more permanent solution: a vaccine. The Vaccine Study Center, led by [Nicola Klein, MD, PhD](#), participated in a [clinical trial](#)

of one of the early vaccines being tested, developed by Pfizer/BioNTech. That trial eventually enrolled a total of 566 patients, ages 12 to 85, at 2 medical centers at Kaiser Permanente Northern California.

At the same time, detection became an important aspect of our research. We were one of 25 recipients of [grants](#) from the National Cancer Institute's [Serological Sciences Network \(SeroNet\)](#) that enables [Jacek Skarbinski, MD](#) and his co-investigators at DOR to explore using serology (blood testing) to better understand the course of the pandemic.

Now that vaccinations have begun across the nation, the work continues for DOR. The Centers for Disease Control and Prevention (CDC) funded the Vaccine Study Center to help carry out a Rapid Cycle Analysis through CDC's [Vaccine Safety Datalink](#) network. The [effort](#) will conduct active surveillance for serious adverse reactions after COVID-19 vaccination.

Despite the heavy focus on battling the pandemic in 2020, other research continued. For instance, our investigators played a [prominent role](#) at the International AIDS Conference in 2020, and presented more than two dozen research findings at the American Society of Clinical Oncology meeting as well. Some researchers examined the rise in telehealth usage while others published results comparing [diabetes programs](#) in the City and County of San Francisco – just a small sampling of the ongoing research being done here.

Continuing to strengthen our research bench, we welcomed several new investigators to DOR this year, including a [new class](#) of The Permanente Medical Group's [Physician Researcher Program](#) and several new early career [research fellows](#).

Despite the unexpected challenges of 2020, it's rewarding to know our research enterprise was nimble enough to not only survive such a year, but to thrive. We work with a strong sense of purpose and optimism, knowing that our efforts help move us all toward a new post-pandemic world in the near future.



[Tracy A. Lieu, MD, MPH](#)
Director, Division of Research

Projects from across the Division of Research made a splash in 2020. Here are some of the year's attention-grabbing stories:

11 BIG RESEARCH STORIES FROM 2020

Wide age range of adults hospitalized with COVID-19

Read Story »

More from *San Francisco Chronicle*

Fewer hospitalized heart attack patients seen during pandemic

Read Story »

More from *KQED News*

Kaiser Permanente joins late-stage COVID-19 vaccine study

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More from *San Jose Mercury News*

On-demand HIV prevention pills show promise

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More from *POZ.com*

Heart attack patients who follow guidelines live longer

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More from *Cardiology Today*

Housing instability linked with poor diabetes control

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More from *MedPage Today*

Women with colorectal cancer fare better with social support

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More from *Health Day*

Standardized reporting of CT scans ups early lung cancer diagnoses

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More from *Health Care Business News*

COVID-19 vaccine trial recruiting teens

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More from *KTVU-TV*

More cannabis use in pregnant women with depression, anxiety, trauma

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More from *Healio.com*

Real-time in-hospital alerts associated with lower patient mortality

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More from *Medscape*

Research Highlights



Behavioral Health and Aging

Intervening with teen mood problems, substance use

Adolescents who had access to a brief intervention and referral to treatment (SBIRT) for substance use or mood problems at a pediatric clinic were less likely to have a related diagnosis 3 years later, according to a study published in [Pediatrics](#). The authors reported on a pragmatic randomized controlled trial of 1,851 adolescents who reported substance use and/or mood symptoms. Those who reported both problems and had access to SBIRT were less likely to have an emergency department visit or diagnosed depression or substance use issue 3 years later. "SBIRT may be an important early intervention to integrate into pediatric primary care to help head off these problems," said Research Scientist [Stacy Sterling, DrPH, MSW](#).

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Alzheimer's disease and statins

The potential for the cholesterol-lowering medication statins to reduce the risk of Alzheimer's disease and related dementias (ADRD) is being explored in a 4-year study led by investigator [Catherine Schaefer, PhD](#). Schaefer and colleagues received \$3 million from the National Institute on Aging to study the large population of Kaiser Permanente Northern California members who have used statins over the past 24 years to explore any potential association with ADRD. "We're able to use the very powerful data resources of Kaiser Permanente, including data collected as part of the [Research Program on Genes, Environment and Health](#), to provide a careful and systematic evaluation of statin treatment and other factors that could increase or decrease risk," Schaefer said.

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Chronic disease and drinking

An analysis of 2.7 million Kaiser Permanente patients with one or more of 26 medical conditions finds that overall, they are less likely to drink alcohol heavily than people without those medical conditions. However, the study in [JAMA Network Open](#) also found higher

risk of unhealthful drinking among people who drink alcohol and who have any of 4 conditions: chronic obstructive pulmonary disease, chronic liver disease, diabetes, and hypertension. Drinking at unhealthy levels "can disrupt (patients') adherence to their treatment and medication regimens, their exercise and nutrition, and exacerbate symptoms," said Research Scientist [Stacy Sterling, DrPH, MSW](#). "These are important things for clinicians to pay attention to."

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Genetics of skin cancer

People can look to the Northern European side of their genetic heritage for increased risk of nonmelanoma skin cancer, according to the first large analysis of genetic risk factors for cutaneous squamous cell carcinoma in diverse populations with European ancestry, published in the journal [Communications Biology](#). "We knew that people of European ancestry with lighter skin have a higher risk of cutaneous squamous cell carcinoma," said lead author [Hélène Choquet, PhD](#). "We wanted to find out the risk both within and between European ancestry populations and other populations, and whether there are genetic factors involved, and it appears that there are."

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Cannabis use and mental health

Researchers examined data from nearly 200,000 pregnancies from Kaiser Permanente Northern California to determine whether depression, anxiety, and trauma during pregnancy are associated with prenatal cannabis use. The study, published in [JAMA Network Open](#), found pregnant women with depression, anxiety, and trauma diagnoses and symptoms were more likely to screen positive for prenatal cannabis use. "This new study adds important evidence to a small but growing body of research suggesting that prenatal cannabis use is more common among pregnant women who are experiencing depression, anxiety, and trauma during pregnancy," said Research Scientist [Kelly Young-Wolff, PhD, MPH](#).

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Gender identity screening

A survey published in the [Journal of Adolescent Health](#) suggested that adding gender identity questions to a pre-visit screening could make those conversations easier for teens and their primary care physicians. Kaiser Permanente researchers added gender identity questions to an intake survey at two adolescent health clinics in Northern California. They also surveyed some of the participating teen patients, their parents,

and their doctors about the experience. Two-thirds of adolescents, 75.5% of parents/guardians, and 92.5% of clinicians said it was important to screen for gender identity in primary care. Less than 2% of adolescents said the question made them uncomfortable.

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Biostatistics Core

Telephone coaching helps pregnant women manage gestational weight gain

Pregnant women with overweight or obesity better controlled their weight gain and improved health behaviors when they received a series of telephone sessions with a registered dietician. "The results from this rigorous trial are very strong," said coauthor and biostatistician [Charles Quesenberry, PhD](#). "However, the trial did not have the statistical power to assess group differences in perinatal complications. Larger trials are needed to assess whether reducing gestational weight gain also reduces perinatal complications." The Gestational Weight Gain and Optimal Wellness (GLOW) trial compared women who were coached by phone with another similar group who received usual prenatal care. The results were published in [The Lancet Diabetes & Endocrinology](#).

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Earlier start to HIV treatment reduces long-term cancer risk

Research that followed a large number of people living with HIV over 15 years found reduced risk of certain cancers is among the benefits of early antiretroviral therapy treatment. The study, led by biostatistician [Romain Neugebauer, PhD](#) and epidemiologist [Michael Silverberg, PhD, MPH](#), pulled together data from nearly 15,000 people diagnosed with HIV between 1996 and 2014. It was published in the journal [Clinical Infectious Diseases](#). "Preventive efforts for virus-unrelated NADCs (non-AIDS-defining cancers) should focus on risk mitigation including screening and reduction in known cancer risk factors such as smoking, obesity, and unhealthy alcohol use," wrote the authors.

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Outreach helps improve adherence to cancer therapy

An outreach program at Kaiser Permanente Northern California showed improved adherence to adjuvant endocrine therapy (AET) for patients with breast cancer. The work, led by Research Scientist [Catherine Lee, PhD](#), appeared in [Breast Cancer Research and Treatment](#) and looked at patient adherence before and after the outreach program was put into place. "Adherence and discontinuation after AET initiation improved modestly following implementation of the outreach program," wrote the authors.

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A comparison of human vs. analogue insulins

Are there major differences between using a human vs. analogue insulin? That's what researchers led by Research Scientist [Romain Neugebauer, PhD](#), wanted to find out. In a [JAMA Network Open](#) study, the research team found there wasn't much of a difference between the two when it came to mortality and cardiovascular risk. "Our results suggest that cardiovascular outcomes and mortality should not be a motivating factor in the decision to start human vs analogue insulin therapy in insulin-naive adults with type 2 diabetes," wrote the researchers.

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Cancer

Early lung cancer diagnosis

A standardized radiology reporting system that automatically refers patients with suspicious lung nodules to a multidisciplinary care team improved the odds that a patient would be diagnosed with lung cancer an early stage. "Historically," said senior author [Lori Sakoda, MPH, PhD](#), "no guidelines have been in place for radiologists to follow for reporting their results. This research, said first author [Thomas Urbania, MD](#), "allowed us to get patients quickly embraced into our system and be taken care of." The paper was published in [Chest](#).

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Studying breast tissue inflammation

Senior Research Scientist [Lawrence Kushi, ScD](#), received a \$4.5 million grant from the National Cancer Institute to study the link between inflammation in the breast's fatty tissue and breast cancer outcomes. The 5-year study will use mastectomy tissue samples and data collected from the [Pathways Study of Breast Cancer Survivorship](#). There may be "a connection between levels of this inflammatory process and survival," said Kushi. If that is the case, "it may be the inflammation in the adipose tissue in the breast is a measure we can add to what we currently use to assess prognosis."

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Risk factors for early puberty

Research published in [BMC Pediatrics](#) found that girls who did not live in a 2-parent household from birth to age 2 were significantly more likely to start puberty earlier than girls who had both parents in their home. "If we can identify risk factors for early puberty, we can then talk about what we can do to reduce the risks of early puberty," which increases risk for various conditions, including cancer, said senior author [Ai Kubo, MPH, PhD](#). The study included 26,044 racially and ethnically diverse girls born in Kaiser Permanente Northern California hospitals.

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Social support for women with colorectal cancer

Post-menopausal women with colorectal cancer were more likely to die from their disease or from any cause if they had low social support before their diagnosis, according to research published in [Cancer](#). The study found that women who reported low social support had 52% higher overall mortality than those who reported high levels of support, and 42% higher mortality from colorectal cancer specifically. "These findings support the idea that women who have supportive friends and family around them when they are diagnosed do better," said lead author [Candyce Kroenke, MPH, ScD](#).

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Cardiovascular and Metabolic Conditions

Fewer ischemic stroke patients at onset of COVID-19

Emergency medicine physicians in Kaiser Permanente Northern California saw fewer patients with stroke symptoms at the onset of the COVID-19 pandemic than they typically do, researchers reported in [Stroke](#). The discharge rate of stroke patients also decreased after the pandemic started. "This means it wasn't that patients with strokes just weren't coming in within the 24-hour window in which they might be able to have a drug that can break up the clot or have the clot removed," said Research Scientist [Mai N. Nguyen-Huynh, MD](#). "They weren't coming to the hospital at all."

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Identifying risk for diabetes after pregnancy

New findings from the Study of Women, Infant Feeding and Type 2 Diabetes After GDM Pregnancy (SWIFT) moved researchers one step closer to developing a blood test to predict which women with gestational diabetes are at highest risk of progressing to type 2 diabetes. If validated, this type of blood test "would allow obstetricians and primary care providers to identify the women most at risk for type 2 diabetes and advise them about changes in behavior to prevent future diabetes," said Senior Research Scientist [Erica P. Gunderson, PhD, MS, MPH](#). The findings were published in [PLOS Medicine](#).

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Hospitalized heart attack patients drop during COVID-19

The weekly number of patients admitted to Kaiser Permanente Northern California hospitals with heart attacks after the onset of the COVID-19 pandemic fell sharply to nearly half of what would be expected, Kaiser Permanente research showed. The findings were reported in the [New England Journal of Medicine](#).

"Elderly patients and those who had previously been diagnosed with heart disease repeatedly heard they were high risk for COVID-19," said lead author [Matthew Solomon, MD, PhD](#). "We worry that our findings suggest these high-risk patients might have stayed home despite having concerning symptoms." [Read More»](#)

Following guidelines helps heart attack patients

Researchers found patients who followed more medical recommendations after a heart attack were more likely to survive years later, and their prospects improved with every additional recommendation they followed. "Our findings support the value of comprehensive secondary prevention efforts such as cardiac rehabilitation

programs and patients' own commitment to their recovery and a healthy lifestyle," said lead author [Matthew Solomon, MD, PhD](#). The results are a positive reflection on Kaiser Permanente Northern California's cardiac rehabilitation program, said senior author [Alan Go, MD](#). The study was published in the [Journal of the American Heart Association](#). [Read More»](#)

Physical inactivity rivals smoking dangers

A study in the [European Journal of Preventive Cardiology](#) that explored relative associations between 6 risk factors for coronary disease and ischemic stroke found a high risk tied to physical inactivity. "The startling finding was that lack of physical activity carried 65% excess risk of cardiovascular complications, similar to that of smoking or poor cholesterol levels," said lead author [Jamal S. Rana, MD, PhD](#). Added senior author [Stephen Sidney, MD, MPH](#): "Improving physical activity needs to have the same public health approach as successful past interventions for smoking cessation and expanding use of cholesterol-lowering therapy." [Read More»](#)



Clinical Trials

KPNC deepens its COVID-19 research agenda

With their work sped up to an unprecedented rate by the urgency of learning how to treat and prevent COVID-19 disease, [Alan Go, MD](#), regional medical director of the [Clinical Trials Program](#) based at the [Division of Research](#), called the frantic atmosphere "working in COVID time." In the spring of 2020, Go's team rapidly set up clinical trials and compassionate use programs for potential treatments. There were numerous efforts launched to study the disease, treatments, and long-term impacts. DOR's work to better understand, treat, and prevent COVID-19 benefits from a deep bench of clinicians and researchers with a history of working collaboratively, says DOR Director [Tracy Lieu, MD, MPH](#). "We are really fortunate to have the bench strength that we do." [Read More»](#)

Virtual, innovative clinical trial on respiratory illnesses

Researchers began recruiting patients for a randomized pragmatic clinical trial conducted entirely electronically and virtually. The trial, called MITIGATE, investigates whether a drug currently used to reduce the risk of heart disease and stroke can also prevent or reduce the risk of complications from viral respiratory illnesses in older adults with heart disease. "For a trial of this size and scope, the use of electronic health records to conduct a trial from recruitment and enrollment to outcome ascertainment is truly unprecedented," said study co-leader [Andrew P. Ambrosy, MD](#), a research scientist and a cardiologist in The Permanente Medical Group. [Read More»](#)

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COVID-19 clinical studies ramp up quickly

In the race to find safe and effective treatments for seriously ill patients with COVID-19, Kaiser Permanente Northern California (KPNC) enrolled patients in nationwide clinical trials and participated in an expanded access program of a novel treatment strategy that used blood plasma from recovered patients. "We get approached almost every other day right now with new treatment ideas," explained [Alan Go, MD](#), regional medical director of the KPNC [Clinical Trials Program](#).

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Deprescribing for older adults with type 2 diabetes

Senior research scientist [Richard Grant, MD, MPH](#) received a \$3.2 million [National Institute on Aging](#) award to develop an online patient education program to help older adults with type 2 diabetes talk to their doctors about using less medication and test its efficacy in a randomized clinical trial. "There is very limited data that shows there is a benefit to keeping sugar levels tightly controlled after age 75," said Grant. "And if these patients take too much medication, it puts them at risk for hypoglycemia, which increases risk for falls and other health concerns."

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COVID-19 vaccine clinical trial

Led by its Vaccine Study Center, Kaiser Permanente participated in clinical trials for the Pfizer/BioNTech COVID-19 vaccine, enrolling 343 patients aged 18 to 85 at 2 medical centers. Later, younger patients were added, first those aged 16-17 then those aged 12 to 15. "Kaiser Permanente is extremely well-positioned to address this public health emergency," said [Nicola Klein, MD, PhD](#), director of the Kaiser Permanente Vaccine Study Center and principal investigator for the trial in Northern California. "We have been a leader in vaccine research for more than 30 years and have participated in clinical trials for almost every vaccine that has been licensed in the United States. We know we can meaningfully contribute to helping determine whether this vaccine is effective in preventing COVID-19 disease."

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Delivery Science

New prostate cancer risk calculator

A new risk calculator developed by Kaiser Permanente Northern California researchers may help men going through prostate cancer screening decide whether to have a prostate biopsy. "Prostate cancer screening has been an enormous problem for many years," said senior author [Andrew L. Avins, MD, MPH](#). "By leveraging our large database at Kaiser Permanente, we sought to create a better tool to help patients and providers determine the value of pursuing a diagnosis after an elevated PSA." The research, led by Adjunct Investigator [Joseph Presti, MD](#), was published in [Urologic Oncology](#).

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Colorectal cancer screening and African Americans

A Kaiser Permanente study showed starting annual colorectal cancer screening at age 45 in African Americans can find colorectal cancers at a rate similar to that seen when screening starts after age 50 – the age most guidelines currently recommend. Data show an increased incidence of colorectal cancer in African Americans at younger ages, but "no one had actually tried to implement a screening program in this age group, so we didn't know if it would work or have any value," said study author [Theodore R. Levin, MD](#). The study was published in [Gastroenterology](#).

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COVID-19 antibody research to illuminate pandemic's course

Researchers with Kaiser Permanente launched a study using blood tests for antibodies to the novel coronavirus to estimate the prevalence and incidence of COVID-19 disease in Northern California and explore whether antibodies confer protection from recurrent disease. Kaiser Permanente Northern California (KPNC) is one of 25 recipients of grants from the National Cancer Institute's [Serological Sciences Network \(SeroNet\)](#) to explore serology (blood testing) as an alternative window into the pandemic. Up to now, KPNC has relied on nasal swab PCR tests that determine whether a patient has active disease, explained Research Scientist [Jacek Skarbinski, MD](#), the project's principal investigator and an infectious disease specialist with The Permanente Medical Group.

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Telehealth benefits heart failure patients

A structured telephone appointment with a specially trained nurse or pharmacist is as effective as an in-person doctor's appointment in preventing early hospital readmissions in patients with heart failure, Kaiser Permanente research showed. "Because we implemented a systems-level intervention leveraging existing follow-up options, this telehealth program has the potential for more widespread adoption in other hospital systems," said [Alan Go, MD](#). The research, led by Adjunct Investigator [Keane K. Lee, MD](#), and published in [Circulation: Cardiovascular Quality and Outcomes](#), is the first to look at telehealth follow-up care for patients after hospitalization for heart failure.

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Endometrial cancer diagnoses down due to COVID-19

The number of patients diagnosed with endometrial cancer in Kaiser Permanente Northern California during the first 12 weeks of the COVID-19 pandemic was more than one-third lower than what would have been expected, Kaiser Permanente research found. "We expected screen-detected cancers like breast cancer would decrease because of the pandemic," said lead author [Betty Suh-Burgmann, MD](#). "But we didn't know what would happen with other cancers. Based on the numbers we saw in our study, we know that there are people out there who have endometrial cancer but remain undiagnosed." The paper was published in [Obstetrics & Gynecology](#).

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Targeting prostate cancer screening

A computerized alert that notifies health care providers when a prostate cancer screening test is not recommended improved adherence to cancer screening guidelines for men age 70 or over, Kaiser Permanente research showed. "The intervention brought screening rates down from 33% to about 12%," said lead author [Joseph Presti, MD](#). Added senior author [Andrew L. Avins, MD, MPH](#): "The beauty of this intervention is that it doesn't require physicians to remember complex guidelines. It simply provides clear information at the point of care to help guide appropriate screening practices." The study was published in the [Journal of General Internal Medicine](#).

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Increased mail order pharmacy use

A targeted outreach campaign to people with type 2 diabetes in Kaiser Permanente Northern California encouraged their mail order pharmacy use and improved their medication adherence. “This study lends evidence to the idea that an outreach program that addresses the specific concerns people with diabetes have about using mail order pharmacy services can be an important part of a strategy to improve their medication adherence,” said senior author [Julie Schmittiel, PhD](#). The research was published in the [Journal of General Internal Medicine](#). [Read More»](#)

Adults hospitalized with COVID-19

One of the first U.S. studies to look at overall hospital admissions of adults with COVID-19 found the proportion of adults who were age 59 or younger admitted to the hospital and intensive care unit in Kaiser Permanente Northern California was similar to the proportion of adults age 60 or older. The research letter, published in [JAMA](#), used data collected on patients hospitalized in March 2020 in all 21 Kaiser Permanente Northern California hospitals. “We were able to do this study quickly because of the research infrastructure that exists within the Division of Research,” said Research Scientist [Laura C. Myers, MD, MPH](#). [Read More»](#)

Telehealth oncology increases during pandemic

After Kaiser Permanente Northern California quickly ramped up its existing telehealth oncology program at the onset of the COVID-19 pandemic, it offered insights for health systems facing similar challenges in an editorial published in [JCO Oncology Practice](#). “The whole world is struggling with and working through how to care for patients virtually when trying to social distance,” said co-author [Mary E. Reed, DrPH](#). “It always helps to hear someone else’s strategies, what considerations went into the strategies, and how it played out. The lessons we learned are clinically urgent now for cancer patients.” [Read More»](#)

Hospital alerts improve outcomes

A sophisticated system that analyzes electronic data about hospital patients, identifies those at risk of deteriorating, and issues an alert to a centralized team of specially trained nurses resulted in a lower mortality rate, according to research published in the [New England Journal of Medicine](#). The study reported outcomes from the Advance Alert Monitor system, used in all 21 Kaiser Permanente Northern California hospitals. “Along with saving lives, the Advance Alert Monitor has demonstrated that it is possible to integrate predictive models into day-to-day operations in our medical centers,” said Research Scientist [Gabriel Escobar, MD](#). [Read More»](#)

Online tools for diabetes

Kaiser Permanente patients with diabetes improved their medication adherence when they began using both an online portal and mobile device to track their health care, according to a study in [JAMA Network Open](#) by Research Scientist [Mary Reed, DrPH](#). The study examined 111,000 patients with diabetes and tracked their portal use, medication use, and blood sugar levels over 33 months. “This is an example of how the health care system, by offering patients access to their own information and the ability to manage their health care online, can improve their health,” Reed said. [Read More»](#)

Predicting sepsis patients

Research Scientist [Vincent Liu, MD, MSc](#), is leading several studies aimed at using data to better predict which patients are likely to develop sepsis. These include a prediction model to identify high-risk patients based on their condition during outpatient visits before a hospitalization. He is also collaborating on a study of the risks and benefits of giving early antibiotics to all sepsis patients. “We need new strategies to take advantage of the rich data available through electronic health records in sepsis patients to drive sepsis research forward,” Liu said. [Read More»](#)

Who uses virtual visits

An analysis in [JAMA Network Open](#) of more than 2 million self-scheduled video and phone primary care visits at Kaiser Permanente Northern California shows that patients were more likely to choose telemedicine over an office visit if they were younger, female, or faced logistical challenges. The study looked at pre-pandemic

visits and found in 14% of appointments patients opted for phone or video instead of an office visit. "Since we found that patients with prior telemedicine experience are more likely to choose it, it's likely that our current pandemic situation could increase patients' appetite for telemedicine going forward," said Research Scientist [Mary Reed, DrPH](#).
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Infectious Diseases

Pregnant women who miss flu shots

An analysis in the [American Journal of Epidemiology](#) of women who did not get flu shots during their pregnancies found the women clustered in geographic "hot spots." These women tended to have fewer prenatal medical visits and live in low-income neighborhoods, suggesting a socioeconomic connection with being unvaccinated for influenza, said Research Scientist [Ousseny Zerbo, PhD](#). "This study contributes to the growing body of evidence associating health status with where people live, and the socioeconomic conditions they live in," Zerbo said.
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during the study period, and few reported missed doses. "Our findings suggest that 2-1-1 is an appealing alternative for some men, especially those who have infrequent sex," said Research Fellow [Carlo Hojilla, RN, PhD](#).
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HIV treatment and cancer

Research that followed a large number of people living with HIV over 15 years found reduced risk of certain cancers is among the benefits of early treatment with antiretroviral therapy. The study, published in [Clinical Infectious Diseases](#), examined data from nearly 15,000 people diagnosed with HIV between 1996 and 2014 at more than 200 clinical sites. "It's really critical to follow the guidelines and get people tested and on therapy as soon as they are diagnosed, since even short delays can impact long-term cancer risk," said epidemiologist [Michael Silverberg, PhD](#).
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Flu vaccine in pregnancy

Women who were given inactivated influenza vaccine while pregnant found no indication of developmental problems for their babies at 6 months old, researchers reported in the journal [Vaccine](#). The authors compared 799 women who received the vaccine with 426 who did not and found no association with negative developmental effects after controlling for factors such as flu status during pregnancy, high-risk medical conditions, and maternal vaccination before pregnancy. "This study offers additional confirmation of the safety of the influenza vaccine for both pregnant women and their children," said Research Scientist [Lyndsay Avalos, PhD, MPH](#).
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On-demand HIV prevention therapy

Patients reported positive outcomes with use of an HIV prevention medication dosed only as needed, instead of the more common daily dosing, Kaiser Permanente researchers reported in the journal [Clinical Infectious Diseases](#). The study followed 279 male patients during their first 3 months of on-demand pre-exposure prophylaxis. None of the patients contracted HIV

Long-term mortality with tuberculosis

People who recovered from active tuberculosis had a higher long-term risk of death from any cause than similar patients who never had active tuberculosis, researchers reported in [JAMA Network Open](#). The study explored whether those who recover continue to be at greater risk of mortality after that first year and found patients with active tuberculosis lost an average of 7 years of life expectancy compared to those without the disease. "Our new findings suggest that boosting tuberculosis screening and prevention could help more people lead longer lives," said Research Scientist [Jacek Skarbinski, MD](#).
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Exercise in early pregnancy

Pregnant women who exercised more during the first trimester of pregnancy had a lower risk of developing gestational diabetes, according to a study in the journal [Diabetes Care](#). The research found that exercising at least 38 minutes per day lowered the risk of gestational diabetes by 2.1 cases per 100 women, and reduced risk of abnormal blood sugar by 4.8 cases per 100 women. "A follow-up study is needed to assess whether 38 minutes or more of moderate intensity exercise each day during pregnancy also reduces the risk of childhood obesity, which is usually increased among children of women with gestational diabetes," said Senior Research Scientist [Assiamira Ferrara, MD, PhD](#).

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Video visits for kids

Parents, children, and pediatricians with Kaiser Permanente Northern California (KPNC) have found advantages to home-based video medical visits, which increased markedly after the beginning of the COVID-19 pandemic, wrote 3 physicians in an editorial in [JAMA Pediatrics](#). The trio, led by [Division of Research](#) Director [Tracy Lieu, MD, MPH](#), describe what they've learned in this transition for about 850,000 children who are KPNC members. "Our rapid learning curve in providing video care has been really impressive," said Lieu, also a practicing pediatrician with The Permanente Medical Group.

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Transitioning to adult autism care

Young people with autism often have complex medical histories that should be passed to their adult care medical providers, Research Scientist [Lisa Croen, PhD](#), and postdoctoral fellow [Jennifer Ames, PhD](#), wrote in 2 research studies published in the journal [Autism](#).

[One study](#) reported higher use of mental health services and lower use of obstetrical and gynecological services among young people with autism during the transition years. The [other study](#) described responses to a survey of pediatric and adult care clinicians, finding they could be raising transition issues with patients with autism earlier in adolescence.

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Coaching to manage gestational weight gain

Pregnant women with overweight or obesity better controlled their weight gain and improved health behaviors when they received a series of telephone sessions with a registered dietician, reported a study in [The Lancet Diabetes & Endocrinology](#). The study, reporting results from the Gestational Weight Gain and Optimal Wellness (GLOW) trial, bolsters the use of telephone coaching, which could be more convenient for busy pregnant women, particularly those with small children at home. "If it's easy to participate in the intervention, the adherence may be higher, and the intervention is more likely to be effective," said Senior Research Scientist [Assiamira Ferrara, MD, PhD](#).

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Diet quality and depression

Pregnant women with depression were more likely to eat poor diets with a higher intake of empty calories and lower intake of greens, beans, and fruit, according to an analysis of 1,160 adult pregnant women who were treated at Kaiser Permanente Northern California. The study was published in the [Journal of the Academy of Nutrition and Dietetics](#). "The findings are a reminder to clinicians that their pregnant patients with depression may be at risk of eating lower quality food," said Research Scientist [Lyndsay Avalos, PhD, MPH](#).

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Breaking the vicious cycle of gestational diabetes

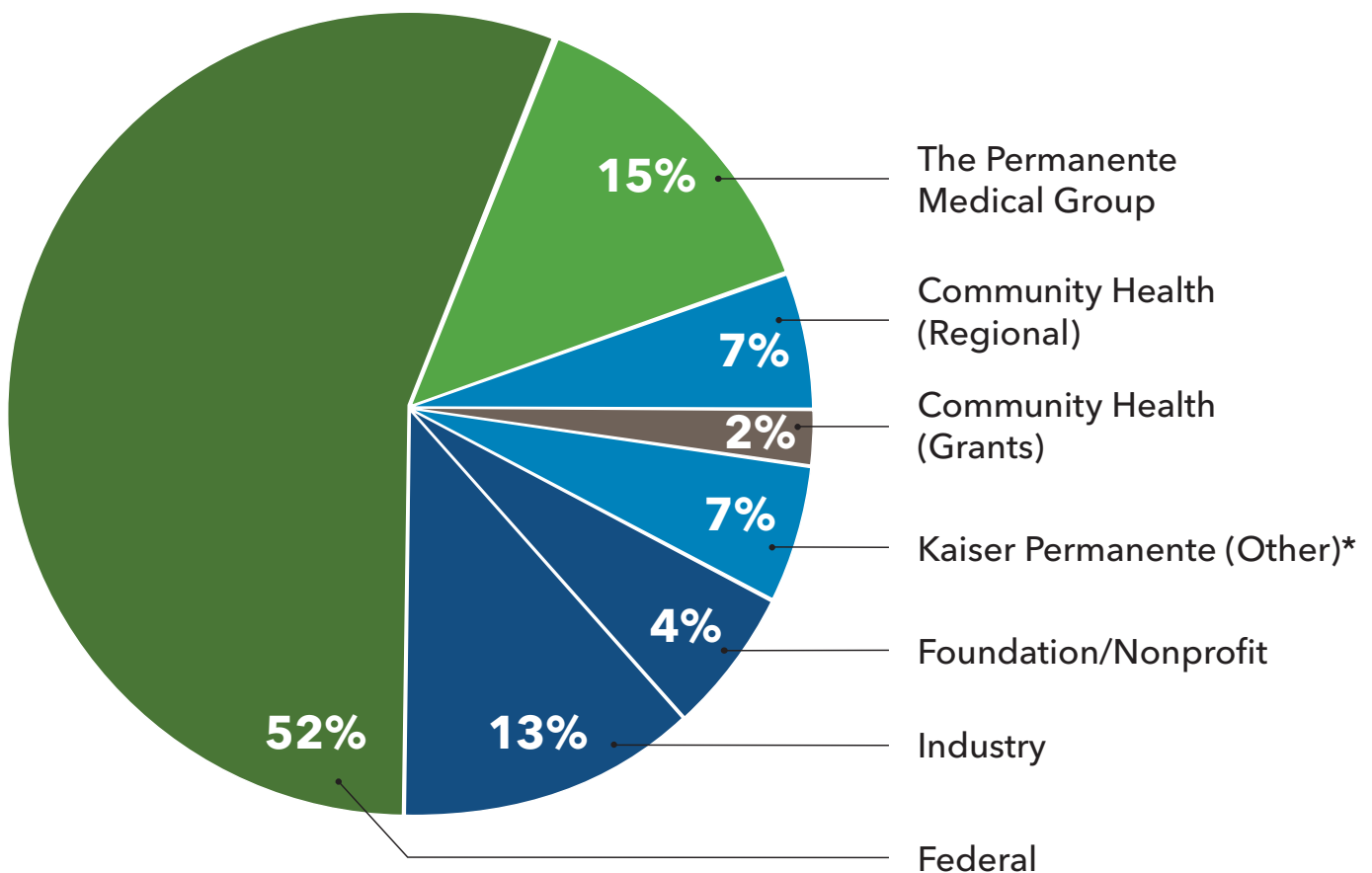
Senior Research Scientist [Assiamira Ferrara, MD, PhD](#), describes what needs to be done to reduce the number of women who develop gestational diabetes (GD) in pregnancy, posing health risks to both themselves and their children, in an article in [Diabetes Care](#). She addresses the diagnostic criteria for GD, trends in prevalence, and prevention interventions. The article covers more than two decades of Ferrara's research at the Division of Research, where, because of its close relationship with an integrated health care delivery system, she was able to advance and translate her research into a model for prevention. The article was presented to the American Diabetes Association as the [2019 Norbert Freinkel Award Lecture](#).

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2020 Financial Report

The Division of Research (DOR) is currently home to **60** investigators and staff scientists, **12** research fellows, and more than **600** employees. DOR also has **43** adjunct investigators from within Kaiser Permanente and other academic institutions. DOR scientists are involved in **526** ongoing research projects and its Clinical Trials Program supports and guides **406** clinical trials. Since 2000, DOR researchers have published more than **5,500** peer-reviewed articles including **538** papers in 2020 alone.

2020 TOTAL REVENUE: \$125 MILLION



Note: In 2020 an accounting change was made adding Clinical Trials Program funding, partially accounting for the increase from the prior year.

**(Incl. CESR, Garfield, KP Biobank, etc.)*

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