

ANNUAL REPORT 2022



RAD-AID's mission is to increase and improve
radiology services in low-resource and
medically underserved regions of the world

Babies and mothers need **ultrasound** for safe delivery.

Cancer patients need **CT/MRI** for staging and treatment.

Trauma and infection victims need **x-ray, ultrasound, and CT** to address injuries and outbreaks.

Heart and stroke patients need **CT, angiography, and ultrasound** for diagnosis and treatment.

OVER HALF THE WORLD LACKS RADIOLOGY

(Source: World Health Organization)



Countries

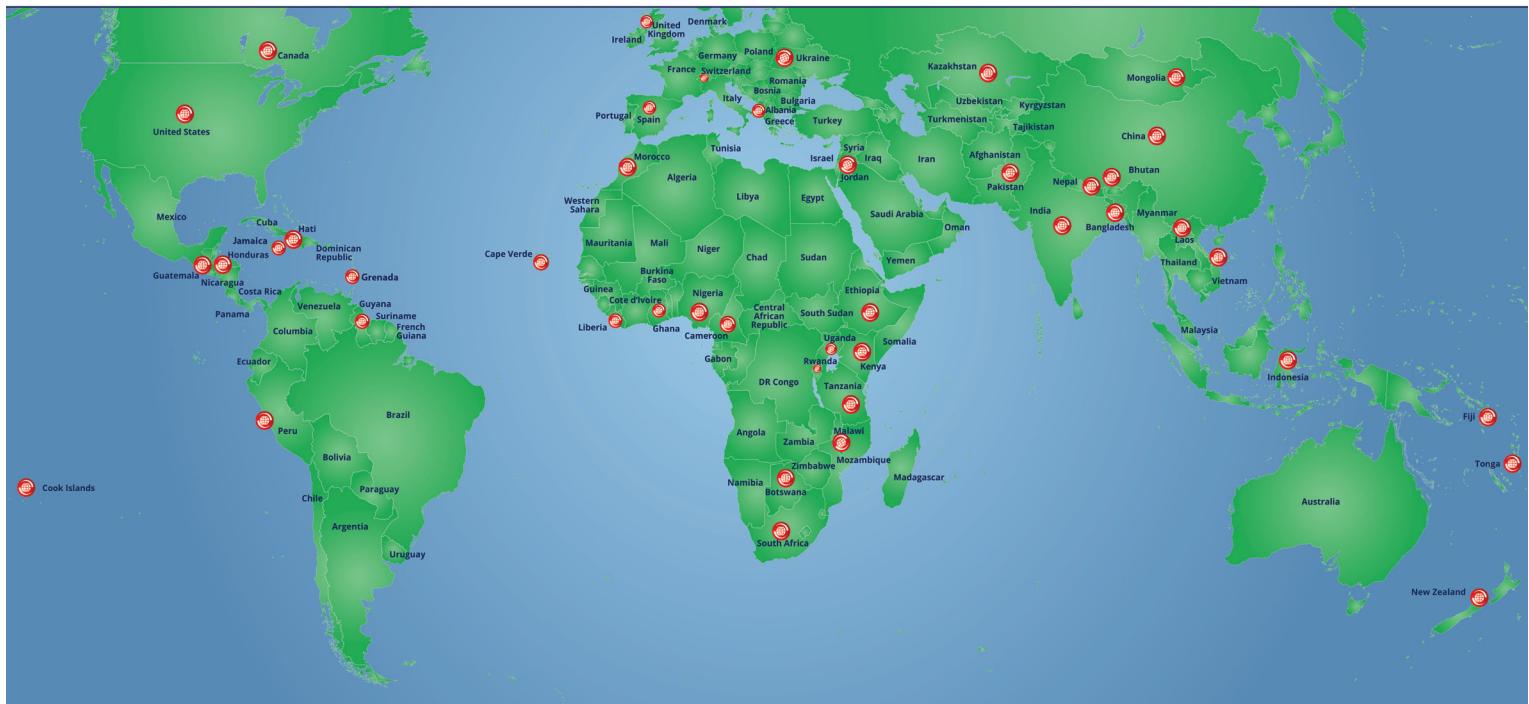


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Letter from Chief Officers

Dear RAD-AID Friends and Supporters,

It is our pleasure to bring you this 2022 RAD-AID Annual Report, which details our mission, history, programs and plans. Whether you are interested in helping a particular country or working on a global health issue related to medical imaging, or assisting via your specialized area of expertise, you can find opportunities here to make a difference. We hope this report shows you how RAD-AID continues to grow in its mission to increase and improve radiology and radiation oncology for medically underserved communities. In 2023, we are celebrating 15 years of RAD-AID's service to the world for advancing international cooperation and global health. We hope you join us to celebrate this exciting milestone!

2022 brought a spirit of change and the resurgence of hope as the effects of COVID lockdowns receded. Although surges and variants have appeared worldwide, borders opened and travel resumed. RAD-AID was ready. Families, friends and colleagues united after what seemed to be an endless threat of lockdowns and closures. As we ramp up international travel and on-site work, RAD-AID continues to prioritize the safety of our volunteers, staff and partners through COVID and any other future pandemic so that we can help low-resource health institutions build life-saving medical imaging capabilities for patients and communities.

Although COVID conditions improved, other challenges to international cooperation and global health have appeared and reappeared that directly impact RAD-AID's work. Many economic gains from international trade in the last two decades have eroded due to regional conflicts, security disputes, and supply chain interruptions that have slipped millions of people back into poverty. New and longstanding wars are fracturing populations and destabilizing international systems of diplomacy. Attempts to manage global health cooperation, energy, and climate are hindered by an increasingly fragmented world of conflicting ideologies and disinformation. These challenges, however, strengthen RAD-AID's resolve and determination for delivering solutions.

Throughout our history RAD-AID grew and adapted to a rapidly changing world. Through vital support from donors and partners, we invested in advanced virtual education systems, readiness assessment tools, and program execution strategies. We streamlined pathways to donate and implement radiology equipment and informatics platforms, which are interwoven into our clinical education methods. Flexibility and adaptability are hallmark features of RAD-AID to leverage existing and new technologies with the best multidisciplinary teams of physicians, nurses, technologists, radiation therapists, dosimetrists, physicists, public health professionals, IT specialists, educators, and administrators. Our core vision is to be a charitable nonprofit organization that places public service above all else. The world may change; our strategies will adapt; our principles are steadfast.

We have some notable recent developments in RAD-AID's work in the last year. We announced the expansion of our ultrasound outreach to include tele-ultrasound so that we can bridge on-site and online ultrasound education via real-time image sharing and case-consultations. We increased our interventional radiology (IR) simulator platforms to deepen virtual and in-person support of IR trainees and staff in new IR fellowships, such as Nigeria and Kenya. RAD-AID launched new programs over the last year, such as Botswana, Cook Islands, Mongolia and Pakistan. These additions bring RAD-AID's reach to 40 countries with service impact areas of over 200 million people. RAD-AID accelerated its donation and implementation of Picture Archiving and Communication Systems (PACS) along with cloud and artificial intelligence (AI). Our support for existing and new radiology residencies in low and middle-income countries (LMICs) has accelerated to over fifteen residency programs. RAD-AID is investing its support for breast imaging fellowship programs, such as in Ghana and Kenya. The RAD-AID USA Women's Health Initiative has brought innovative breast and cervical cancer screening with patient navigation to over 10,000 women over the last year, including mobile and fixed-site health facilities in Seattle/Pacific Northwest, Colorado, Arizona, Texas, Alabama, Georgia, Washington DC, North Carolina, New York, and Chicago. RAD-AID scaled up work in nuclear medicine for global health, such as fellowship training, image quality, radiation safety, supply-management and equipment in Africa. Our radiation oncology program is achieving new milestones for therapists, oncologists, dosimetrists and nursing for linking oncology care to radiology's screening and diagnostic services.

There is much more we could say here, and the pages that follow show some photos and updates about these exciting developments. We are deeply thankful to our partners, supporters and volunteers. We welcome you to join the exhilarating adventure of public service, charitable outreach, and global health innovation. You can bring your creativity, ideas, expertise, and experience to RAD-AID so that we can work together to help the world.

Thank you for supporting RAD-AID,

Daniel J. Mollura, MD
President and CEO

Anne-Marie Lugossy, MPH, BHSc, RT(R)
Vice President and COO

Lauren Fuller Kulinski, MHA, RT(R)(MR), MRSO
Treasurer and CFO





Officers and Management Team

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Anne-Marie Lugossy, Vice President and Chief Operating Officer
Lauren Fuller Kulinski, Chief Financial Officer

(Alphabetical)

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Bob Dixon, Director, RAD-AID Kenya
Michelle Dorsey, Director, RAD-AID Bangladesh
Diana Dowdy, Director, Midwifery and Women's Health Point of Care Ultrasound/Associate Program Manager, RAD-AID Grenada
Patricia DuCharme, Director, RAD-AID Nursing
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Abass Noor, Program Manager, RAD-AID Botswana
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Luyao Shen, Program Manager, RAD-AID China
Amy Small, Assistant Program Manager, RAD-AID Ethiopia
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Susan Sotardi, Director, RAD-AID Ethiopia
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Jamie Surratt, Director, RAD-AID Guyana
Steve Surratt, Director, RAD-AID Guyana
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Chidubem Ugwueze, Program Manager, RAD-AID Nigeria
Jonathan Vaccaro, Associate Director, RAD-AID Guyana
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Joseph Weygand, Program Manager, RAD-AID Medical Physics
Alicia White, Program Manager, RAD-AID Radiation Oncology
Chad Wilcox, Program Manager, RAD-AID Interventional Radiology
Raymond Wong, Assistant Program Manager, RAD-AID Interventional Radiology
Marianna Zagurovskaya, Program Manager, RAD-AID Kazakhstan
Susan Zehr, Associate Program Manager, RAD-AID South Pacific
Jonathan Zember, Program Manager, RAD-AID Pediatrics

Board of Directors

(Alphabetical)

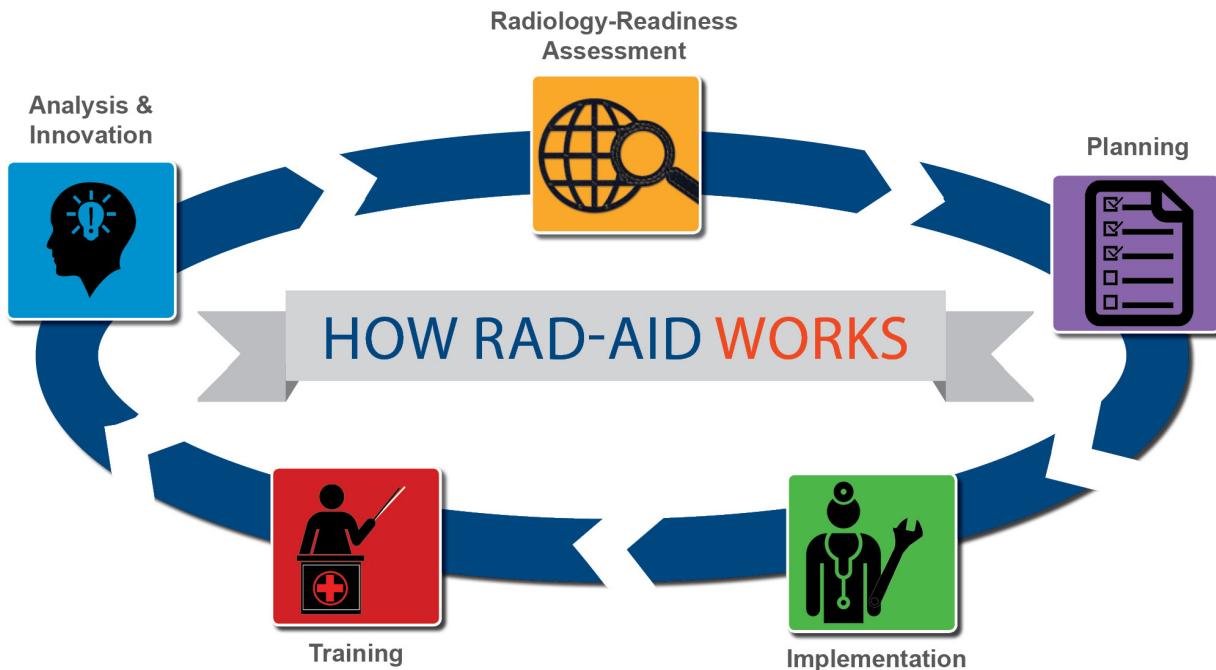
Issack Boru, Imaging Services Manager, Duke University
Farouk Dako, Assistant Professor, University of Pennsylvania
Sonnie Dockser, President, Sonnie Foundation
Theresa Loar, Former Senior VP International Programs, CH2M
Geraldine McGinty, Senior Associate Dean for Clinical Affairs, Weill Cornell Medicine
Daniel J. Mollura, (Board Chair) Founder, RAD-AID International
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Geoffrey D. Rubin, Professor & Chair of Medical Imaging, University of Arizona
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Liana Watson, ABII Coordinator, American Registry of Radiologic Technologists
David Youmans, MD- Diagnostic/Interventional Radiologist Princeton Radiology, Applied Radiology

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Kristin Roberts
Brian Choi



How RAD-AID Works



RAD-AID uses a simple method for analyzing, planning and implementing projects. The first step is **Radiology-Readiness**, which is RAD-AID's trademarked data collection and analysis tool, so that we can optimize every radiology project for the specific needs, infrastructure constraints, and health care system attributes of a region, community or facility. The Radiology-Readiness step measures existing resources at a facility, analyzes the clinical goals of that facility, and offers a targeted solution to fill vital gaps to connect existing resources with those goals.

Once we conduct the Radiology-Readiness Assessment, we **plan** the project based on the data. Third, we **implement** the project based on the plan, such as installing hardware, configuring workstations, organizing training, writing research, or designing a new technology, which are accomplished through RAD-AID's multidisciplinary team structure. Fourth, education is a central part of everything we do, and we hold **training** sessions so that RAD-AID can train in-country partners to use and maintain the implemented program. More importantly, our teams also receive training and education from our in-country partners so that we can learn from them about clinical and cultural factors that will influence the success of our collaborative program.

Lastly, we work with our in-country partners to **analyze** the results of the program, to find what worked and what did not work. In this way, we identify new challenges to solve and find

new resources to strengthen the program. Then, we return to step one and repeat our **Radiology-Readiness** assessment so that we can see how our project had positive impact and what gaps need to be addressed. This circular iteration of data, analysis, planning, self-correction and new data collection keeps RAD-AID moving forward.

In 2022, RAD-AID advanced our Radiology-Readiness tool by adding more subspecialty assessment sections, such as a Tele-Ultrasound Readiness Assessment and a Midwifery and Women's Health Point-of-Care Ultrasound Readiness Assessment, which provide great additions to our existing assessments for Breast Imaging, Informatics, Interventional Radiology, Nursing, Radiation Oncology, Equipment Planning, Nuclear Medicine, and Quality and Safety. Our Radiology-Readiness tools provide more robust program planning for our volunteers and partners. We also translated Radiology Readiness into four languages with more languages on the way, to widen cultural applications and facilitate partnership-development.

This approach to 'How RAD-AID Works' is flexible because it adapts to local cultural and clinical conditions so that each program is uniquely suited to the country and specific health goals, while scalable as a clear step-by-step process for improving health around the world.



Haiti

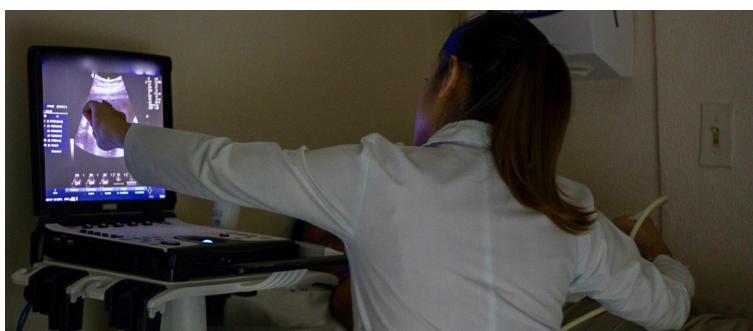
RAD-AID has worked in Haiti since the earthquake of 2010 to build radiology capabilities in Port-au-Prince, Gonaives, Caracol and other locations. For over a decade, RAD-AID has provided educational support for the radiology residency at University Hospital of Haiti. RAD-AID has opportunities for radiologists, technologists, physicists, nurses, IT professionals and public health specialists to join RAD-AID teams for tele-lectures and on-site work in Haiti.



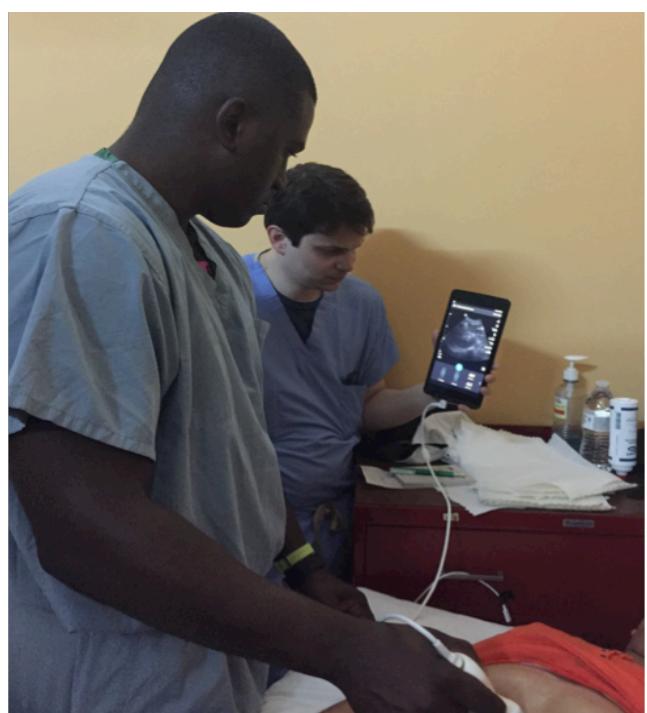
RAD-AID Haiti in Port-au-Prince, May 2017

Nicaragua

The RAD-AID Nicaragua program brings vital radiology support and training to rural and urban regions of the country, including general ultrasound, women's health, and pediatrics. RAD-AID donated and implemented a Picture Archiving and Communication Systems (PACS) for digital imaging and storage at four Nicaraguan hospitals in Managua with support from IBM Watson Health Imaging, impacting care for 3 million people annually. RAD-AID also contributes funding and clinical educational support to Nicaraguan radiologists and frontline health workers at Amos Health and Hope in the Nejapa community.



RAD-AID Nicaragua, Supporting Ultrasound in Collaboration with Amos Health and Hope for Nicaragua, 2018



RAD-AID Nicaragua, Ultrasound Outreach and Education, September 2016



RAD-AID Guyana, April 2022



RAD-AID Guyana, Ultrasound Educational Sessions, May 2022

Guyana

The RAD-AID Guyana Program began in 2013 in partnership with the World Health Organization's Pan American Health Organization (WHO/PAHO). In 2016, RAD-AID donated 2 CT scanners to Guyana at Bartica and New Amsterdam Hospitals, with support from Philips Foundation. Due to the lack of in-country pathways for training radiologists, RAD-AID started Guyana's first-ever radiology residency at Georgetown Public Hospital in 2017, which now graduates approximately 5 radiologists per year. Through an innovative PACS-based tele-education system (RAD-AID Friendship Cloud, details on page 29, with support from Ambra and Google Foundation), RAD-AID provides remote clinical teaching and support for Guyana's technologists, residents, attendings, nurses and IT professionals. In 2022, RAD-AID returned to providing on-site support to technologists, nurses, residents, and radiologists, while continuing virtual support.



RAD-AID Nursing Providing CT Contrast Reaction Code Drills in Guyana, May 2021

Jamaica

RAD-AID Jamaica launched operations in 2016 to support radiology development at Kingston Public Hospital, University of the West Indies and Cornwall Regional Hospital. The RAD-AID Jamaica team is working on clinical education for in-country radiology professionals, trainees, students and staff. RAD-AID is conducting and analyzing multi-institutional Radiology Readiness Assessments to further refine the RAD-AID Jamaica program for the years to come.

Grenada

RAD-AID is building radiology in Grenada through our support of Grenada General Hospital, Spice Isle Imaging Center, Princess Alice Hospital, Princess Royal Hospital, and St. George's University, through projects that include general and obstetric/midwifery ultrasound, radiation safety, emergency radiology services, clinical radiology training, and nursing. In 2021-22, RAD-AID supported the installation of a CT scanner at Grenada General Hospital by delivering educational and clinical assistance to CT technologists, medical physicists, and radiology nurses. Under the leadership of Diana Dowdy, Director of RAD-AID Midwifery and Women's Health Point-of-Care Ultrasound, and in collaboration with Inteleos, RAD-AID created an ultrasound curriculum for midwives and skilled birth attendants for improving maternal health outcomes.



RAD-AID Jamaica, November 2018.



RAD-AID Grenada, Ultrasound Educational Sessions, May 2022

Guatemala

RAD-AID Guatemala has partnerships with Instituto de Cancerología (INCAN) and Hospital Roosevelt in Guatemala City. RAD-AID supports cancer imaging and PACS at INCAN. RAD-AID completed a Radiology Readiness Assessment at Hospital Roosevelt, with plans underway to provide educational support across many modalities for the Guatemalan radiology residents at Roosevelt.



Peru

RAD-AID launched a novel program in Peru in 2019 linking women's health resources in rural regions of Cusco near the Andes Mountains with tertiary care services in Lima through partnerships with CerviCusco and Instituto Nacional de Enfermedades Neoplásicas (INEN). RAD-AID provides educational training and imaging resources, such as mammography and ultrasound, with community-based outreach for strengthening referral networks across Peru between primary and specialty care. RAD-AID collaborated with Koios Medical for donating and implementing decision-support breast ultrasound artificial intelligence technology, to help CerviCusco's front-line health workers to detect, triage and refer breast cancer patients.



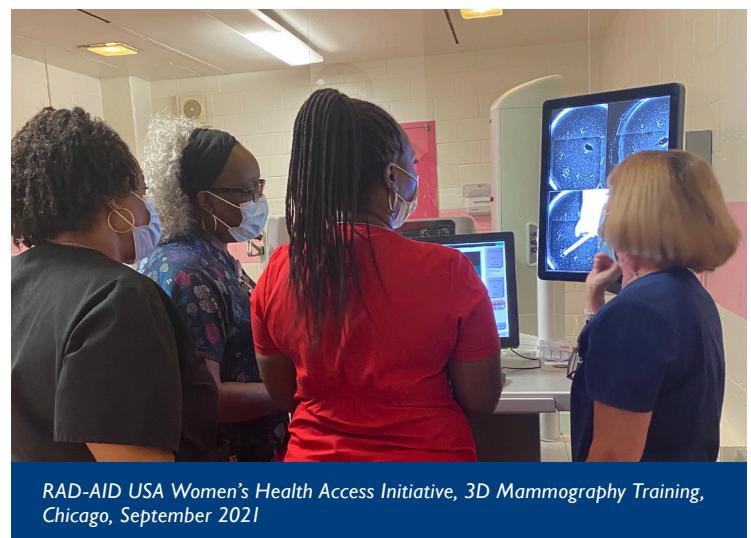
RAD-AID's mission is to increase and improve radiology and medical imaging in low-resource settings and medically underserved regions of the world.



USA

RAD-AID has rapidly expanded programs in the United States for medically underserved communities. In addition to 85 RAD-AID Chapters in the US (see page 28 for details on our chapters), RAD-AID has collaborated with The Health Wagon, a nonprofit health charity, in the Appalachian regions of the US, to deliver ultrasound and radiography services. In 2021, RAD-AID upgraded its donation of PACS (with support from Ambra Health) to Health Wagon and Smiddy Clinic. In 2022, RAD-AID provided ultrasound and radiography support for Health Wagon's annual screening camps.

In 2020, we launched RAD-AID USA Women's Health Program, with support from Hologic, to address breast and cervical healthcare disparities among women of color across the United States. This program builds vital breast and cervical screening capabilities at key partner sites (see map below), with innovative patient-navigation strategies for helping women of color to overcome challenges and barriers in health services. In 2021-2022, RAD-AID USA Women's Health Program has expanded to increase access to care throughout the USA.



RAD-AID USA Women's Health Access Initiative, Map of Breast and Cervical Cancer Screening Sites in the USA, Updated September 2022 (*at the time of publication, the Houston and North Carolina sites were in final stages of program planning)

Canada

RAD-AID is actively developing programs for northern regions of Canada where health resources are scarce in remote locations. Through our partnership with the Canadian Hub for Applied and Social Research (CHASR) at the University of Saskatchewan, RAD-AID uses geographic information systems (GIS) to measure health care disparity and strategize radiology health care delivery in Canada as well as many RAD-AID sites in low- and middle-income countries and medically underserved regions of high-income countries. RAD-AID has a partnership with Sonography Canada and the Canadian Association of Medical Radiation Technologists (CAMRT) to jointly increase medical outreach initiatives within and outside of Canada. RAD-AID is working with Straightline Aviation to develop hybrid airship technology for transporting advanced health equipment and services to northern Canadian regions lacking transportation infrastructure.

In 2022, RAD-AID and the CAMRT initiated a collaboration with the Nunatukavut Community Council (supporting over 6,000 Inuit of south and central Labrador) to assess gaps in radiology delivery.



RAD-AID is about the holistic picture of radiology. Not just the equipment but also the people and all of the other resources that go into making it effective.



RAD-AID Africa & Middle East

Ethiopia

RAD-AID Ethiopia launched in 2015 for supporting MRI, CT, ultrasound, radiography, and mammography capabilities at St Paul's Hospital and Black Lion Hospital in Addis Ababa. RAD-AID implemented PACS at Black Lion Hospital in early 2018 with support from MedWeb. In 2021-2022, RAD-AID continued to deliver remote tele-lecture and case-based sessions with Ethiopian partners on breast imaging, ultrasound, and CT. A PACS system was also donated and implemented at the University of Gondar College of Medicine and Health Sciences, to advance radiology development in Northern Ethiopia.



RAD-AID Ethiopia in Gondar Region, Ultrasound Education, January 2018

Ghana

RAD-AID's program in Ghana began at Korle Bu Teaching Hospital (KBTH) in 2012 and has grown to include installation of PACS in 2013, upgrade of PACS in 2016, installation of Radiology Information System (RIS) in 2018, PACS-integration with EMR in 2020-21 (with support from Society of Imaging Informatics in Medicine and IBM Watson Health Imaging), and the donation of high-resolution radiology monitors (supported by vRad) in 2021. These healthcare IT operations over the last decade are integrated with RAD-AID's longitudinal clinical training in Ghana for MRI, CT, breast imaging, ultrasound, interventional radiology, pediatrics, and nuclear medicine.

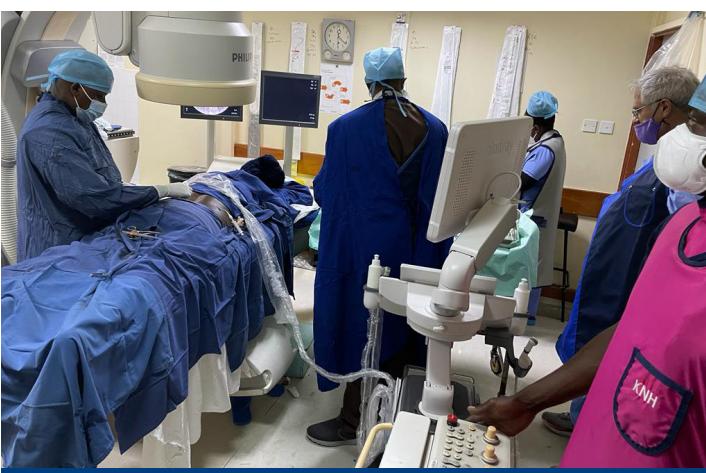
In 2021-2022, in collaboration with the Ghana Association of Radiologists (GAR), RAD-AID has supported the development of breast imaging and neuroradiology fellowship programs. RAD-AID Ghana also supports Eastern Regional Hospital (Koforidua), 37 Military Hospital, and Komfo Anokye Teaching Hospital (KATH).



RAD-AID Ghana, April 2022



RAD-AID Kenya, Breast Cancer Outreach Screening Event, October 2019



RAD-AID Kenya, Interventional Radiology at the University of Nairobi, April 2022

Kenya

The RAD-AID Kenya program is a multifaceted collaboration to assist breast imaging, interventional radiology, radiation oncology, and informatics. RAD-AID Kenya implemented the first interventional radiology fellowship program in Kenya (2020) with the University of Nairobi and pioneered real-time high fidelity interventional radiology simulations (with support from Mentice) to tele-teach IR procedures in Kenya using hands-on computer-simulated procedures. In 2021-2022, RAD-AID launched PACS and artificial intelligence radiology collaborations with UoN, Kenyatta National Hospital, and Aga Khan University Hospital, with support from Koios Medical and Ambra Health, continued its partnership and educational symposiums with the Kenya Association of Radiologists, and returned to on-site teaching in interventional radiology.

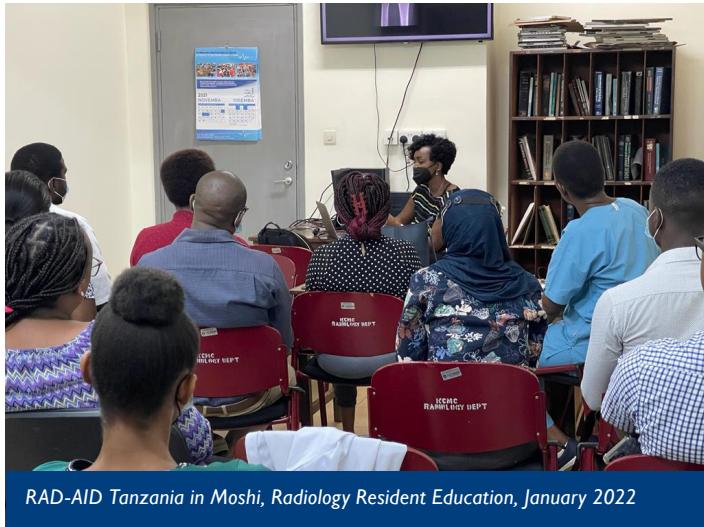
The RAD-AID Radiation Oncology program is advancing safety, dosimetry, and oncologic treatment planning in Kenya, strongly complementing RAD-AID's diagnostic and interventional radiology programs in the region. In 2021-2022, in partnership with ASRT and Varian (a Siemens Healthineers Company), RAD-AID delivered structured didactic and clinical hands-on education to support the radiation therapy workforce in Kenya.



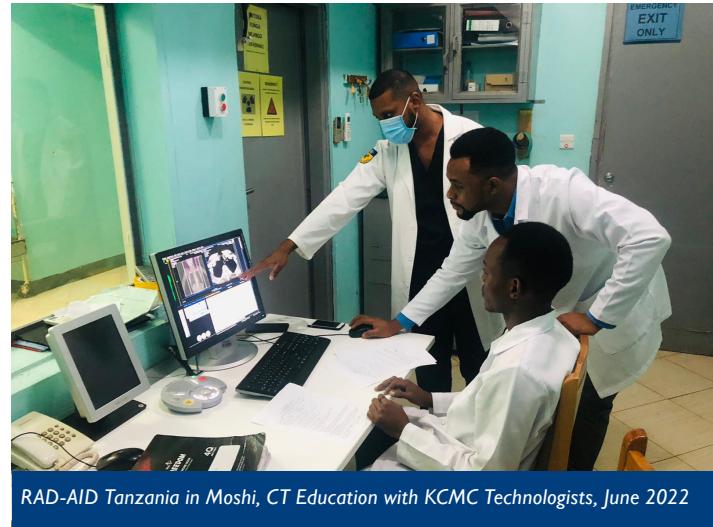
RAD-AID Radiation Oncology, Radiation Oncology Training at Kenyatta National Hospital, June 2022

Tanzania

RAD-AID Tanzania began in 2015 to help address severe radiology personnel shortages. Tanzania has nearly 100 practicing radiologists to care for 60 million people and a hundred-fold lower number of radiologic technologists per capita than high-income countries. RAD-AID Tanzania provides educational support to radiologists, sonographers, nurses, and technologists in Arusha (NSK Hospitals), Moshi (Kilimanjaro Christian Medical Centre - KCMC), Dar es Salaam (Aga Khan Hospital and Muhimbili National Hospital), Mwanza (Bugando Medical Centre), and in Stonetown, Zanzibar (Mnazi Mmoja Referral Hospital). In 2021-2022, RAD-AID delivered virtual and onsite educational opportunities to radiology residents and technologists at KCMC, Aga Khan, NSK, and Mnazi Mmoja. RAD-AID implemented donated handheld breast imaging ultrasound units (supported by Hologic) at KCMC and NSK, and high-resolution diagnostic monitors (supported by vRad) along with complete dedicated workstations at KCMC.



RAD-AID Tanzania in Moshi, Radiology Resident Education, January 2022



RAD-AID Tanzania in Moshi, CT Education with KCMC Technologists, June 2022

Malawi

Malawi has fewer than five radiologists serving over 18 million people with no in-country training programs to boost capacity. The RAD-AID Malawi program was launched by the RAD-AID University of North Carolina Chapter in 2012. Our Radiology Readiness Assessment showed a significant need for training radiologists, technologists and sonographers. Consequently, in addition to RAD-AID's direct on-site and remote training of Malawi's radiology professionals, RAD-AID has given scholarship support for technologists and physicians and has partnered with the Malawi Children's Initiative (MCI) for pediatric and maternal-infant imaging. In 2021-2022, RAD-AID Malawi continued to implement ultrasound education, implemented donated handheld ultrasound units (supported by Hologic), partnered with UNC and Queen Elizabeth Central Hospital in Blantyre to develop Malawi's first radiology residency program, and returned to provide on-site support at Kamuzu Central Hospital (KCH).



RAD-AID Malawi, Teaching Pediatric Ultrasound, August 2022

RAD-AID began in 2008 to answer this need for more radiology and imaging technology in the resource-limited regions and communities of the world.



RAD-AID Cape Verde, Radiographic Interpretation, 2017

Cape Verde

The RAD-AID Cape Verde Program began in 2013. Cape Verde is a nation of 10 islands having 500,000 people off the coast of West Africa. Having little or no local educational infrastructure for radiology professionals, RAD-AID teams focus on ultrasound and radiography at imaging and primary care centers, including São Filipe Regional Hospital and Mosteiros Hospital.

Morocco

The RAD-AID Morocco program began in 2016, with outreach projects including mobile radiology in collaboration with Moroccan Association for the Protection of Health, as well as PACS, medical physics, safety and image quality, and clinical radiology education at Ibn Sina Hospital in Rabat. RAD-AID's strategy in Morocco combines education at tertiary academic centers and rural community outreach. In 2021-2022, RAD-AID Morocco implemented weekly intensive remote didactic and case-based sessions in support of Moroccan radiology resident education.



RAD-AID Morocco, Ultrasound-Guided Biopsy Training, June 2019

South Africa

RAD-AID's program in South Africa launched in 2016 in conducting Radiology-Readiness Assessments at multiple health institutions in Western Cape, including urban and rural settings. In 2017-2018, RAD-AID initiated Geographic Information Systems (GIS) research for advanced mapping of South African health care disparities in parallel with infrastructure features (roads, airports, railroads, etc.) in the Limpopo region.

Nigeria

Nigeria's population of 186 million people has an estimated 250-300 radiologists, fiftyfold fewer than the US per capita, with large gaps in radiology equipment and health IT resources. Since 2016, RAD-AID's program in Nigeria has supported the education of radiologists, technologists and nurses. In 2019, RAD-AID implemented a donated PACS (RAD-AID Friendship Cloud), with support from Ambra Health and Google Cloud, to University College Hospital (UCH) in Ibadan. In 2022, RAD-AID Nigeria partnered with UCH and IRDOCNIGERIA to develop an interventional radiology fellowship, provided support to St-Dominic's Hospital (with support from MissioInvest), and supported breast imaging at Lagos State University Teaching Hospital in Lagos and at Obafemi Awolowo University Hospital in Ile-Ife.



Liberia

The RAD-AID Liberia program supports radiology development and education at JFK Memorial Hospital, Redemption Hospital, ELWA, Phebe, and JFD-Tappita Hospital. Through a robust partnership with Mount Sinai Medical Center (NY) and the World Bank, RAD-AID sent consecutive rotating teams to Monrovia to provide education to radiologists and technologists, including radiography, CT, interventional radiology procedures, ultrasound and radiology residency curriculum development. During the COVID-19 pandemic, RAD-AID instituted regular video-conference based teaching and case-discussions with residents, students and professionals in Liberia. In 2021-2022, RAD-AID Liberia donated lead aprons (with support from Mavig) to partner hospitals and returned to on-site support to foster collaborative partnerships with host facilities.



Botswana

RAD-AID launched RAD-AID Botswana in 2020 to support radiology infrastructure, PACS, and education at Princess Marina Hospital, in Gaborone, Botswana. Since 2021, RAD-AID has supported the education of radiology residents and a medical physicist trainee through scholarships. In 2022, RAD-AID Botswana's leadership assessed current radiology capacity throughout the country, met engaged stakeholders, and contributed towards the design and implementation of Botswana's first radiology residency program. The RAD-AID University of Pennsylvania Chapter is a significant contributor to the RAD-AID Botswana program.



RAD-AID Botswana, Chest Radiography Interpretation, January 2022



RAD-AID Jordan/Middle East, Radiology Training Za'atari Refugee Camp, October 2019

Jordan/Middle East

Over six million refugees have been displaced by the last decade of turmoil and conflict in the Middle East. Refugee camps and health care centers have been set up to help refugees, often afflicted by a wide range of diseases and conditions in need of medical support such as pregnancy, obstetrics, pediatrics, infections, and trauma-care. RAD-AID is helping to address this humanitarian crisis by providing radiology support to refugee camps, such as a collaboration with Syrian American Medical Society in Jordan. For example, RAD-AID is providing ultrasound imaging for refugee healthcare at Za'atari refugee camp in Jordan, and we aim to further increase the radiology resources at sites needing urgent care for displaced populations.

Uganda

In 2022, RAD-AID (with support from MissioInvest) provided radiology infrastructure support, expertise, and education at Kitovu St-Joseph's Hospital. A team travelled on-site to assess the hospital's readiness to implement a new and more advanced CT and to implement updated radiography and sonography equipment.



RAD-AID Uganda, Reading Room, May 2022



RAD-AID Uganda, Outreach Team Consisted of a Technologist, a Radiologist, and a Medical Physicist, May 2022

Europe

RAD-AID has multiple programs and partnerships in Europe to advance radiology for medically underserved populations. Approximately 15% of RAD-AID's volunteers and supporters are from European health institutions. As of 2021, RAD-AID has outreach programs in Albania and Ukraine, in addition to institutional partners in Spain, United Kingdom, Belgium, France and Germany. RAD-AID has a representative in Geneva to support the World Health Organization headquarters in our WHO official relations capacity for assisting global health policy initiatives.



Nepal

The RAD-AID Nepal program began in 2014 at Tribhuvan University Teaching Hospital in Kathmandu, and expanded via RAD-AID's Disaster Response team in the aftermath of Nepal's earthquake in 2015. In 2016, RAD-AID donated and implemented PACS at three institutions with supportive radiology education running in parallel. RAD-AID launched a partnership with Hospital and Rehabilitation Centre for Disabled Children (HRDC) in Nepal in 2018 to advance Nepal's pediatric radiology, ultrasound and musculoskeletal imaging, in addition to presenting the RAD-AID Nepal Program at the United Nations Civil Society Conference in 2019. In 2022, RAD-AID donated and implemented PACS (with support from Ambra Health) at TUTH, and continued to support educational outreach (with support from the RAD-AID University of Colorado Chapter).



China

RAD-AID's program in China sustained radiology and radiation oncology capacity-building efforts in Yinchuan from 2010-2018. Our program successfully achieved its collaborative milestones, and has now transitioned to the Chinese partner institutions for self-management and sustainability. We thank our partner hospitals in Yinchuan for collaborating with RAD-AID for over eight years to advance radiology and radiation oncology for the medically underserved in China.



Bhutan

The RAD-AID Bhutan program began in 2014 in collaboration with faculty from George Washington University Medical Center and the World Health Organization. Bhutan has only one CT scanner serving a population of 750,000 scattered by large distances of mountainous terrain. RAD-AID sponsored Radiology-Readiness Assessments in Bhutan in 2015 and 2016, showing large gaps in imaging technology and substantial needs for CT, ultrasound and radiography education.

Mongolia

In 2020-21, RAD-AID launched a new RAD-AID Program in collaboration with a primary care facility in Ulaanbaatar, Mongolia's capital city. Current program activities include radiologic technologist education, radiation safety, MRI protocol optimization and medical imaging educational curriculum development. In 2022, a first team of technologists visited the site to conduct didactic and hands-on training in sonography and CT.



India

RAD-AID's work in India began in 2010 with the establishment of Asha Jyoti ("Ray of Hope" in local Punjabi language) in the innovation of a specially designed mobile women's health clinic for osteoporosis, breast cancer and cervical cancer screening of marginalized women in Northern India. Surpassing the targets set by RAD-AID and the partner hospital (PGIMER Chandigarh), Asha Jyoti has delivered care to over 20,000. In 2021-2022, RAD-AID worked with partners to provide remote education in women's imaging.



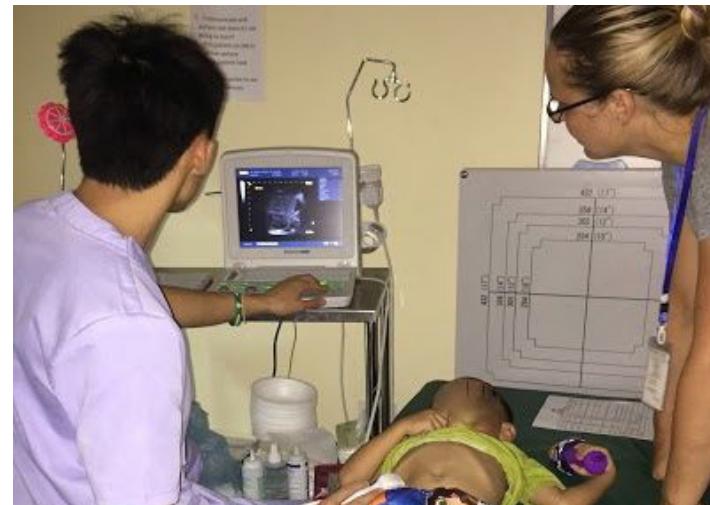
RAD-AID has grown to include more than 15,000 volunteers from 164 countries, 85 university-based chapter organizations, on-site programs in more than 40 countries, and an annual conference on global health radiology.

Laos

The RAD-AID Laos program assists the development of new radiology for Lao Friends Hospital for Children (LFHC), which opened in 2015. RAD-AID sends regular teams to train and support the radiology department in the hospital, particularly for ultrasound and x-ray radiography. In October 2015, RAD-AID implemented the first PACS system in the country at LFHC, providing digital imaging and radiology exam storage for the hospital. RAD-AID donated a new ultrasound unit to LFHC, and advanced the radiology protocols and ordering systems for the hospital. For these accomplishments, RAD-AID won the Healing Asia Award from LFHC's NY-based foundation, Friends Without A Border in April 2017. In 2018, RAD-AID expanded PACS and initiated new CT support for LFHC and the adjacent government hospital, Luang Prabang Provincial Hospital (LPPH), and upgraded LFHC's PACS to a RAD-AID Friendship Cloud system in partnership with Google Cloud, Ambra Health (an Intelerad company), Tribalco and SIIM. Ongoing efforts in Laos are focused on educational efforts in ultrasound, radiography, and CT.



RAD-AID Laos, Pediatric Ultrasound Training at LFHC, August 2017



RAD-AID Laos, Pediatric Ultrasound Training, September 2017

Kazakhstan

RAD-AID launched a program in Kazakhstan in 2016 at Kazakh Institute of Oncology & Radiology (KazIOR) in Almaty, Kazakhstan. RAD-AID's efforts in Kazakhstan are focusing on transitioning from post-Soviet training models for radiology residents, and increasing educational resources for CT, MRI, and x-ray radiography. Ongoing efforts include educational support for PET/CT imaging in Kazakhstan to advance resources for oncologic diagnostics and treatment-management.



RAD-AID Kazakhstan at KazIOR, February 2019



RAD-AID Vietnam, Interventional Radiology Simulation Training, April 2019

Vietnam

RAD-AID launched a program in Vietnam in 2017 via support from the RAD-AID Mayo-Jacksonville chapter. The program is currently based at Da Nang General Hospital and Hue University Hospital. RAD-AID goals include radiology education for interventional radiology and neuroradiology, as well as support for PACS and health informatics.



RAD-AID Bangladesh, Ultrasound Breast Biopsy Training, 2020

Bangladesh

RAD-AID Bangladesh launched in 2019 in partnership with M Abdur Rahim Medical College Hospital in Dinajpur. Leveraging the Radiology Readiness Assessment data, program goals include implementing health informatics and PACS to reach underserved and rural communities from tertiary care institutions. RAD-AID Bangladesh is building educational opportunities across all modalities and specialties of imaging.

Pakistan

RAD-AID Pakistan launched in 2021-2022 with a primary site located in Karachi. The program plans to provide multimodality education to technologists, support to radiology residents and radiologists, and support the hospital's expansion, which includes the implementation of a nuclear medicine department.

Indonesia

Indonesia has approximately 2000 radiologists for a population of 270 million people, across a country of over 17,500 islands, of which 6000 are inhabited. The RAD-AID Indonesia program launched in 2020 to support specialized radiology/fellowship training in Jakarta at Rumah Sakit Cipto Mangunkusumo (RSCM) and its affiliated Faculty of Medicine Universitas Indonesia (FKUI). RAD-AID instituted breast imaging, interventional radiology, neuroradiology, and pediatric imaging education. RAD-AID is also working on PACS-readiness assessments to help link tertiary care radiology and IT resources in Jakarta with low-resource islands in Indonesia.



RAD-AID Indonesia, CT Scanning of a Patient at Faculty of Medicine, Universitas Indonesia/Rumah Sakit Cipto Mangunkusumo, February 2021

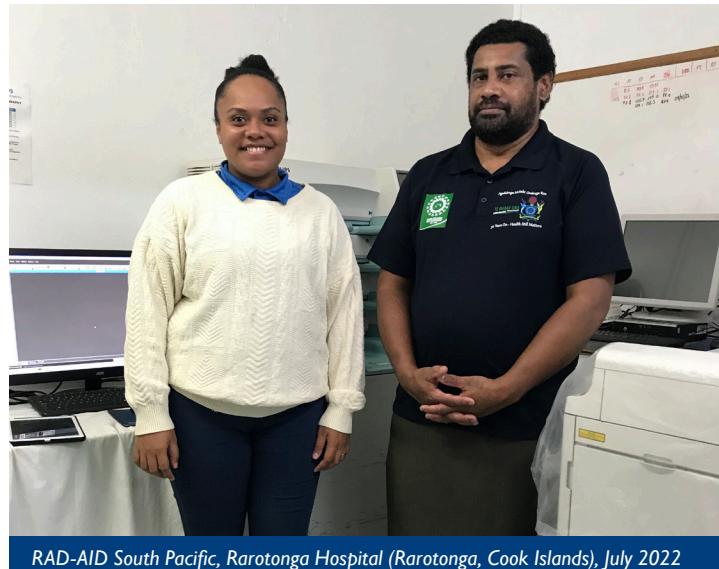


RAD-AID Indonesia, Breast Imaging Review, 2021

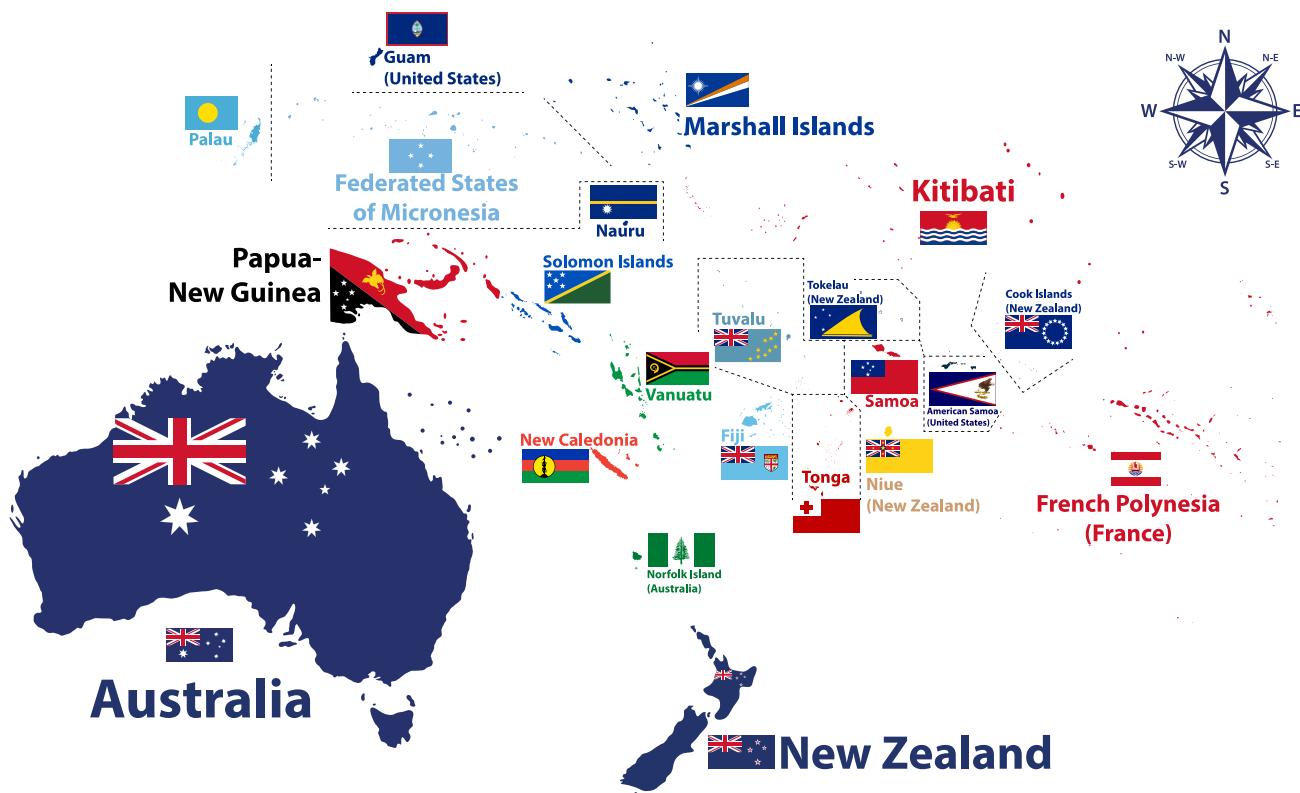


RAD-AID South Pacific

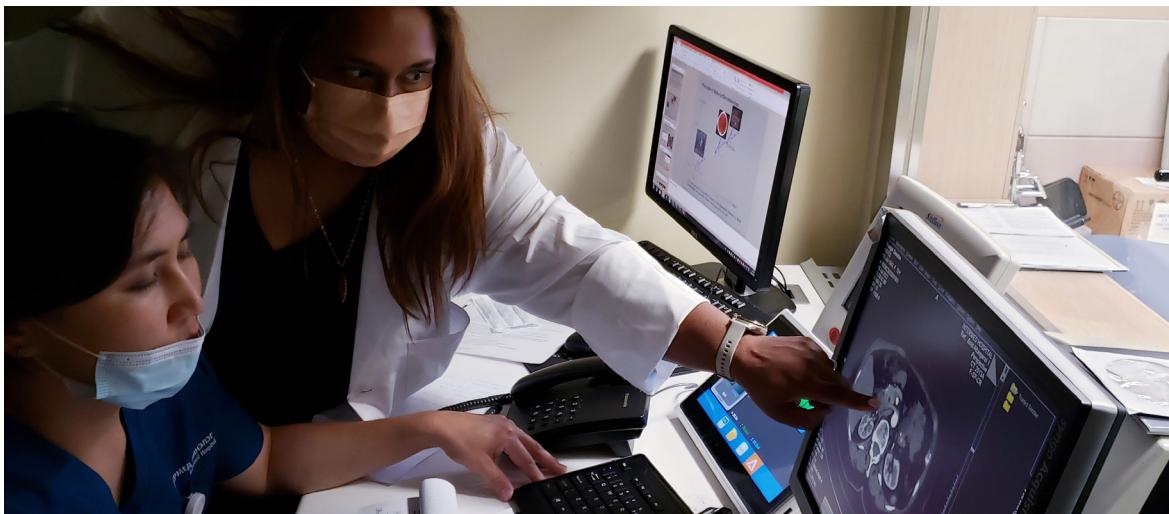
RAD-AID launched the South Pacific program in 2020-21 to address health disparities and lack of radiology resources among islands, communities, and nations in this region of the world. The RAD-AID Radiology Readiness Assessment was conducted amongst facilities in Rarotonga (Cook Islands), Samoa, Fiji, and Tonga. Outreach trips to Rarotonga and Tonga demonstrated similar needs for ultrasound, radiography, CT, and breast imaging support.



RAD-AID South Pacific, Rarotonga Hospital (Rarotonga, Cook Islands), July 2022



RAD-AID launched the South Pacific program to address health disparities and lack of radiology resources.



RAD-AID Mongolia, CT Technologist Training, July 2022

Education and training constitute the cornerstone of RAD-AID's effort to build in-country radiology capacity for health care. Education and training constitute the cornerstone of RAD-AID's effort to build in-country radiology capacity for health care in medically underserved regions. RAD-AID has several key interlocking, synergistic and complementary forms of education that form a well rounded approach:

- **On Site** in-country RAD-AID teams performing hands-on training to local personnel
- **Online learning** via the **RAD-AID Learning Center** and learning management system to provide pro bono internet based didactic educational content.
- **RAD-AID textbook**, “**Radiology in Global Health**,” second edition, which was published in 2018.
- **Certificate of Proficiency in Global Health Radiology and Radiation Oncology** is a successful program launched by RAD-AID in 2015, providing semester-based courses led by RAD-AID's Chief Operating Officer, including readings, discussions and project mentorship.
- **Medical Student Global Health Education** program at RAD-AID offers an online course so that students may receive comprehensive radiology global health training to earn the RAD-AID Global Health Radiology Medical Student Training Certificate, and then complete fieldwork in our teams to become a RAD-AID Global Health Radiology Medical Student Scholar.
- **RAD-AID Chapters Network**, now consisting of more than 85 Canadian and US-based academic radiology institutions, receives project support, funding, and educational webinars from RAD-AID in support of radiology residents, faculty, students, and technologists to boost global health projects in underserved and international settings.



RAD-AID Guyana, Radiography Technologist Education, March 2022



RAD-AID Tanzania, MRI Physics Education at KCMC in Tanzania, June 2022



RESEARCH & ASSESSMENT



RAD-AID Leads Health IT and Radiology Informatics Training Bootcamps and Workshops for In-Country IT Specialists to learn PACS and Other Vital Imaging Platforms, Tanzania, September 2019

RAD-AID's data driven model requires robust attention to data collection, analysis, and planning. This model includes:

- Radiology-Readiness Assessments for optimizing radiology at the facility-level in planning RAD-AID programs.
- Country Reports for analyzing general national health care needs and systemic radiology and radiation oncology resources.
- Geographic Information Systems (GIS): RAD-AID builds interactive data-driven maps showing radiology scarcity and our capacity-building efforts, led by Dr. Ryan England, and in collaboration with Canadian Hub for Applied & Social Research (CHASR).
- RAD-AID Conference – a unique international radiology forum – annual since 2009 for presenting and discussing programs.
- Population Health for social determinants of health and health care disparities in the RAD-AID USA Women's Health Initiative.
- Multilingual sub-specialty assessment tools have been added to our general Radiology-Readiness tool, such as interventional radiology, informatics, nursing, radiation-oncology, breast imaging, ultrasound, tele-ultrasound, nuclear medicine, equipment planning and more.

RAD-AID builds an organizational culture that inspires creativity, drives innovation, and rewards perseverance. Always persevere.



ANNUAL RAD-AID CONFERENCE: 14 YEARS



RAD-AID Conference, in Main Hall at World Health Organization, Pan-American Health Organization, Regional Headquarters Washington, D.C., November 2017.

Although there are numerous conferences on medical imaging and radiology for radiology professionals held throughout the year, there was never one dedicated forum for global outreach and international radiology development. To answer this need, the RAD-AID Conference was formed at Johns Hopkins in 2009 and has been run on an annual basis every year since. In recent years, the RAD-AID Conference has increased attendance by about 500% since its founding, now regularly attended by over 300 participants and hosted by the World Health Organization.

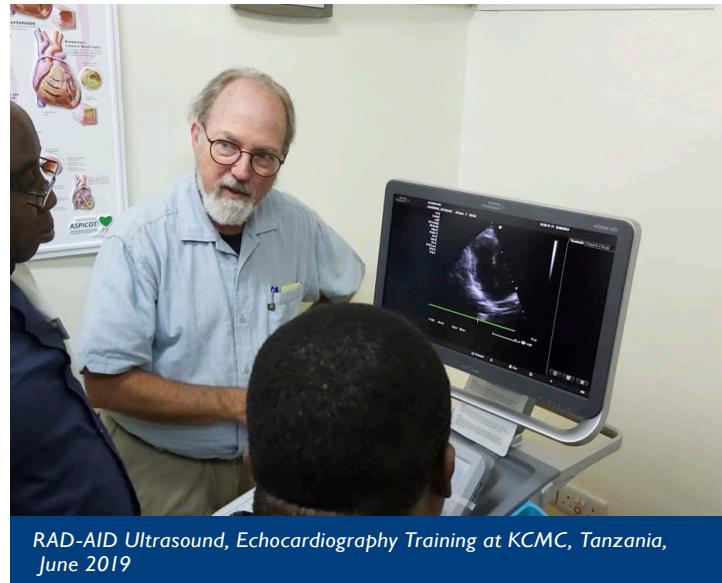
After 2 years of hosting virtual conferences due to the Covid-19 pandemic, RAD-AID returned to an in-person conference at George Washington University (with the regular Conference venue at WHO/PAHO unavailable due to construction). The Conference is routinely scheduled for the first Saturday in November, and coincides with the International Day of Radiology (IdoR) in early November.

RAD-AID's management team consists of three key components to bring the best talent, experience and expertise to the development of RAD-AID programs: Operational, Regional and In-Country Leaders.



Informatics & Health IT

RAD-AID has implemented and managed digital radiology, health IT and PACS in over 15 countries. We facilitate donations of IT software, and provide advanced pro bono training on medical software applications to low-resource hospitals and in-country IT professionals. In 2021-2022, RAD-AID assisted low-resource hospitals through a PACS-based teaching and consultation platform, such as in Guyana, Nigeria, and Laos. RAD-AID accelerated its artificial intelligence (AI) donation program, using our Teach-Try-Use model (published in Radiology, 2020) of providing AI education, installing infrastructure for piloting AI, and then gradually scaling up clinical use of AI. Many PACS, AI and Cloud companies, such as Ambra Health (now an Intelerad company), Densitas, Google Cloud, Amazon Web Services (AWS), IBM Watson Health Imaging, Koios Medical, and Qure.ai, have generously contributed to the RAD-AID Informatics program. RAD-AID is also partnered with the Society for Imaging Informatics in Medicine (SIIM) for SIIM members to serve as RAD-AID team members abroad in the Global Ambassadors program.



RAD-AID Ultrasound, Echocardiography Training at KCMC, Tanzania, June 2019

Nursing and Midwifery

are vital for radiology such as prenatal ultrasound, emergency triage for trauma imaging, CT patient safety, interventional radiology procedures, IV contrast management, patient-navigation, and primary care. RAD-AID has partnered with the Association of Radiologic and Imaging Nurses (ARIN) and supports nursing events at the United Nations for International Nurses Day. RAD-AID launched a program for midwives and skilled birth attendants to effectively use point-of-care ultrasound to triage, detect and manage obstetric emergencies.



RAD-AID Nursing, Breast Health Education, Guyana 2019

Interventional Radiology

RAD-AID supports interventional radiology training for fellowship programs and hospitals in Guyana, Ethiopia, Ghana, Tanzania, Vietnam, Kenya, and Nigeria. In 2020, RAD-AID established the first-ever IR fellowship at University of Nairobi. Through our partnership with Mentice, RAD-AID innovated simulator-based training of IR professionals for remote, real-time, high fidelity case-based instruction.

Medical Physics

RAD-AID's medical physicists work in our teams to optimize radiology image quality, accuracy, and patient safety. Examples include medical physics planning for new CT services, mammography quality assurance, radiography service management, MRI protocols, nuclear medicine readiness assessment, and more.



RAD-AID Radiation Oncology, Therapist Training at Kenyatta National Hospital, Kenya, June 2022

Radiation Oncology

RAD-AID supports radiation oncology as a critical component of the cancer pipeline, contributing to the direct reduction of cancer mortality. RAD-AID supports the optimization of oncology services with robust program planning for sustainable outreach.

Safety and Quality

RAD-AID launched a Safety and Quality Program to support CT and MRI safety. The program is currently helping departments improve CT and MRI protocols and optimize image quality.

USA Women's Health Program

RAD-AID leads a multiyear program to increase patient navigation, breast/cervical cancer screening, and health education for women of color in the United States. This program began 2020, and is supported by Hologic and collaborates with Black Women's Health Imperative. Sites include NY, Washington DC, Pennsylvania, Georgia, Alabama, Chicago, Denver/Colorado, Seattle/Washington, Arizona, Texas, and North Carolina.

RAD-AID International and the American Association of Medical Dosimetrists (AAMD) are pleased to collaborate on a program that offers medical dosimetrists the opportunity to contribute to the health care needs of the developing world.



RAD-AID Establishes Important Partnerships to Build Radiology Capacity in Medically Underserved Communities, Such as Launching Mobile Mammography with Breast Care for Washington (BCW), Washington DC, June 2019

Partnerships play an essential role in RAD-AID's efforts to form well-rounded approaches to international health and public service. We are very thankful to the following partners in working with us to make radiology and healthcare more accessible for medically underserved communities (shown below alphabetically):

Amazon Smile
 Amazon Web Services
 Ambra Health (an Intelerad company)
 American Association of Medical Dosimetrists (AAMD)
 American College of Radiology (ACR)
 Association for Radiologic and Imaging Nursing (ARIN)
 American Society of Radiologic Technologists (ASRT)
 Aperian Global
 Applied Radiology
 Bayer
 Black Women's Health Imperative
 Breast Care for Washington
 Canadian Association of Medical Radiation Technologists (CAMRT)
 Center for Accelerated Real Time Analytics (CARTA)
 CerviCusco
 Canadian Hub for Applied and Social Research (CHASR)
 City Cancer Challenge Foundation (C/Can)
 Clinton Global Initiative
 CureMetrix
 Densitas
 East Africa Medical Assistance Foundation
 Envision Physician Services
 Friends Without a Border
 Google Cloud
 Google Foundation
 Hexarad Radiology
 HI-IQ
 HIMMS
 Hologic, Inc.
 Inteleos

Koios Medical
 MD.ai
 MedWeb, Inc.
 Mentice, Inc.
 MissioInvest
 IBM Watson Health Imaging (Merge)
 Nurses with Global Impact
 Philips
 Philips Foundation
 Project Hope
 PURE
 qure.ai
 Radiology Partners (RP)
 Siemens Healthineers
 Society of Breast Imaging (SBI)
 Society for Imaging Informatics in Medicine (SIIM)
 Society of Interventional Radiology (SIR)
 Society of Nuclear Medicine and Molecular Imaging (SNMM)
 Society and College of Radiographers (United Kingdom)
 Sonography Canada
 Straightline Aviation
 Therapixel
 Tribalco
 Virtual Radiologic (vRad, a Radiology Partners Company)
 World Federation of Pediatric Imaging (WFPI)
 World Federation for Ultrasound in Medicine and Biology (WFUMB)
 World Health Organization (official relations status since 2015)



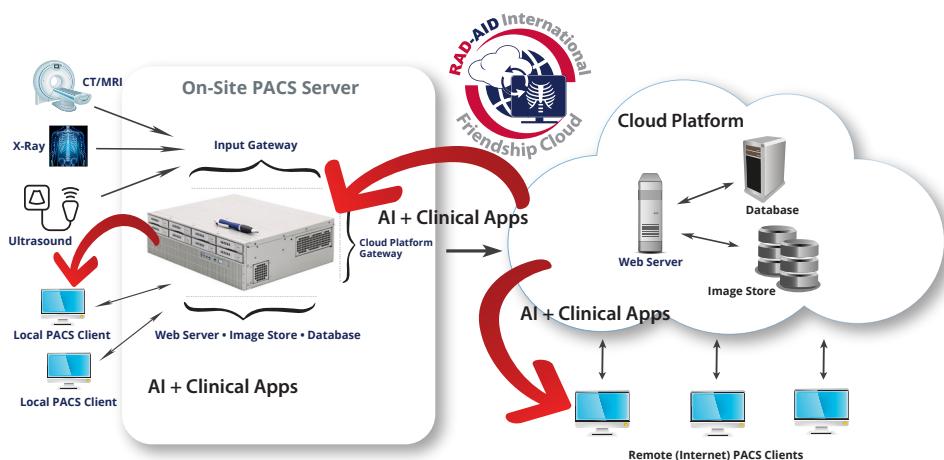
RAD-AID UTHealth Chapter in Morocco, 2019

The RAD-AID Chapters Network launched in 2012 and gives US and Canadian academic medical centers the ability to form RAD-AID chapters for local mentorship, project support, and funding. Each chapter provides a grassroots mentorship community so that staff, faculty, residents, and students can gain experience in global health and contribute to charitable activities. Chapter projects may be local to their community and region within the US and Canada, as well as link to RAD-AID global programs in the 38 countries where we serve. Chapter members are eligible for direct support and funding from RAD-AID to develop new programs and participate in existing programs. Chapter member projects can be remote, such as tele-teaching and webinars, or on-site projects such as direct education and capacity building (equipment, software, clinical support, etc.). The RAD-AID Chapters Network is a vibrant community that grew to 7 institutions in 2013, 25 chapters in 2014, 53 institutions in 2016, and over 85 chapters by mid-2022. Learn more about RAD-AID Chapters online to apply, establish, grow or renew your chapter.





INNOVATIONS



RAD-AID blends charity, public service and technology innovation to push the envelope of what radiology and radiological therapies can bring to the world. Innovations drive our vision for the future, to empower our teams and partners to bring more care to more people worldwide. Some innovations from RAD-AID include:

- Artificial Intelligence Donations using RAD-AID's Teach-Try-Use Model
- RAD-AID Friendship Cloud for local+cloud flexible PACS architecture in low-resource hospitals.
- Tele-IR Simulation-Based Real Time Teaching: Simulation-based procedures with real-time remote demonstration and instruction (supported by Mentice)
- Tele-Ultrasound for Point of Care Women's Health: real time shared imaging and procedure instruction/supervision
- Geographic Information Systems (GIS): using GIS to better analyze health care disparities, design solutions, and measure impact
- Hybrid Airship aircraft-based mobile health with Straightline Aviation
- Designing algorithms and pathways for detecting and remedying racial bias in radiology artificial intelligence (supported by Google Foundation and University of Maryland Baltimore County/Center for Accelerated Real Time Analytics (CARTA))
- Patient-navigation strategies for women of color in the United States to access cervical, breast and gynecological health services (supported by Hologic's Project Health Equality initiative, and in collaboration with Black Women's Health Imperative).



RAD-AID Interventional Radiology Using a High-Fidelity Simulator to Teach Radiology Residents (supported by Mentice), University of Nairobi, Kenya, 2019

We welcome you to become part of RAD-AID as a growing global organization of advocates for medical technology in poor and developing countries.

RAD-AID Mobile Health brings radiology to those in need via transport vehicles for overcoming geographic, infrastructural, and sociocultural barriers. In 2012, RAD-AID launched Asha Jyoti for cancer screening to marginalized women in India. In 2016, RAD-AID announced a novel partnership with Straightline Aviation to build the first medical airship with deployable container-based clinics, designed to reach remote areas that lack transportation infrastructure. In mid-2017, RAD-AID deployed assistance teams to The Health Wagon in Appalachia, Virginia, for rural underserved in the United States. In 2019, RAD-AID donated a mobile mammography vehicle to Breast Care for Washington, to launch a partnership bringing breast cancer screening and diagnostics to the medically underserved communities



RAD-AID Mobile Health designs and implements mobile solutions to overcome health care disparities, including truck-based clinics

of Washington DC. In 2019, we also supported mobile programs in Morocco and Ukraine. In 2020, in partnership with Hologic's Project Health Equality Initiative, RAD-AID added support for patient navigation and multiple mobile mammography vehicles for RAD-AID USA - Women's Health Program, including Denver, Seattle, Georgia, and Alabama. In 2021-2022, RAD-AID's Women's Health program expanded to offer innovative and life-saving services to even more sites across the US.



RAD-AID is partnered with The Health Wagon for radiology capacity-building in Appalachian region of Virginia, including mobile outreach, low-resource rural medical facilities, and Remote Area Medical (RAM) free-clinic events.



As a partnership between RAD-AID and PGIMER Chandigarh, Asha Jyoti has given medical care to over 19,500 women since 2012



In 2019, RAD-AID launched a partnership and mobile mammography program with Breast Care for Washington for community-based breast cancer screenings in medically underserved areas in and near Washington DC.



LOCKHEED MARTIN / RENDERING

RAD-AID Medical Airship photo based on collaborative trip with Lockheed Martin to Ghana, 2017



FINANCIALS

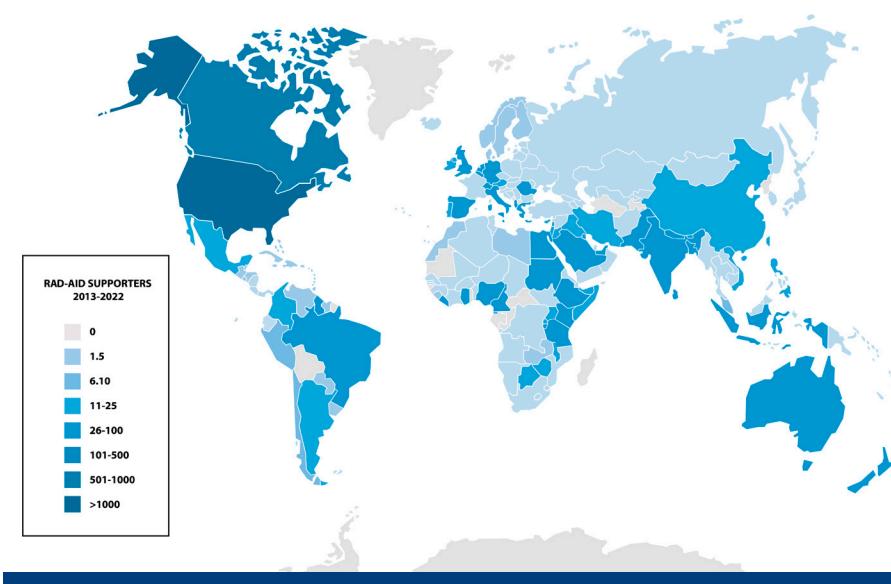
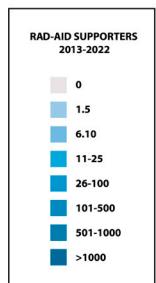
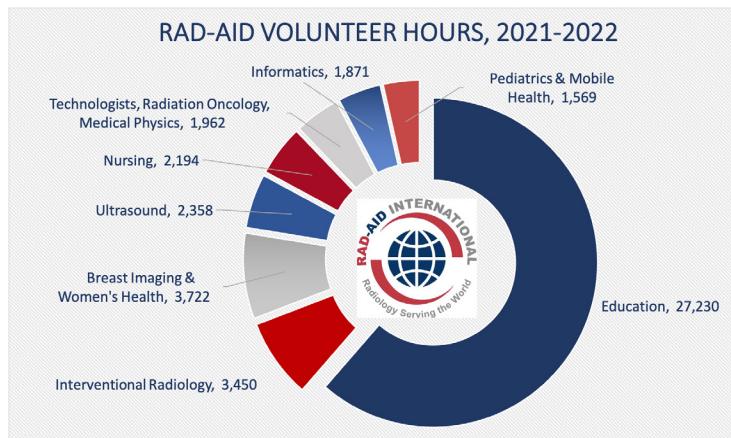
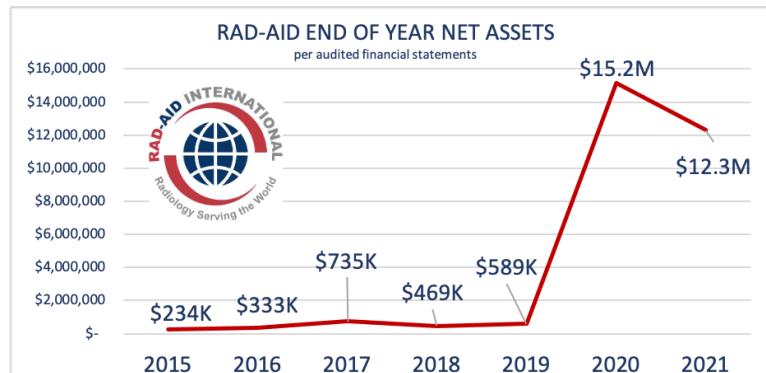
RAD-AID remains committed to best financial practices. In 2022, RAD-AID received the Platinum Seal of Transparency from Candid (previously known as GuideStar), and maintains a perfect rating by Charity Navigator.

Over the last 6 years, our administrative expenses remain under 15% of our total revenues, with over 90% of expenses directed to program services. Detailed financial statements are always available on our website.

Between 2021-2022, RAD-AID volunteers donated over 44,000 hours of pro bono work towards radiology education and capacity building, valued at \$2.6 million of in-kind support. Since our inception, RAD-AID has contributed over \$19 million in donated equipment, grants, and personnel-time to underserved regions around the world.

Every dollar of your donated money, minute of your donated time, and portion of your donated equipment is very valuable to RAD-AID and directly correlates to our accomplishment of our mission. We thank you for your support and contributions!

RAD-AID received a Platinum Seal of Transparency from Candid/GuideStar for 2020-2022, Gold Seal of Transparency for 2017-2020, and maintains a perfect rating from Charity Navigator





CONCLUSION

Conclusion and Thank you!

We hope this annual report from RAD-AID has been informative as an overview of our progress and efforts to bring radiology and healthcare to the billions of people in need around the world.

We are inspired by the contributions from our volunteers and supporters. RAD-AID began in 2008 with a handful of supporters in 2008 and has grown to over 15,000 volunteers and supporters from 164 countries helping nearly 100 health facilities. Radiology is fundamental for nearly all aspects of healthcare, including surgical planning, trauma, cancer care, obstetric prenatal services, respiratory infection response, and cardiovascular management to name a few. Without radiology, health care systems across the world suffer numerous gaps that crack the chains of effective health care delivery. RAD-AID answers this call to meet those needs and serve the world.



A Nonprofit Public Service



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rad-aid-international



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