

RAD-AID's mission is to increase and improve radiology resources in the developing and impoverished regions of the world.

# 2021 ANNUAL REPORT



[RAD-AID.org](https://RAD-AID.org)

# The Need for RAD-AID

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**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.

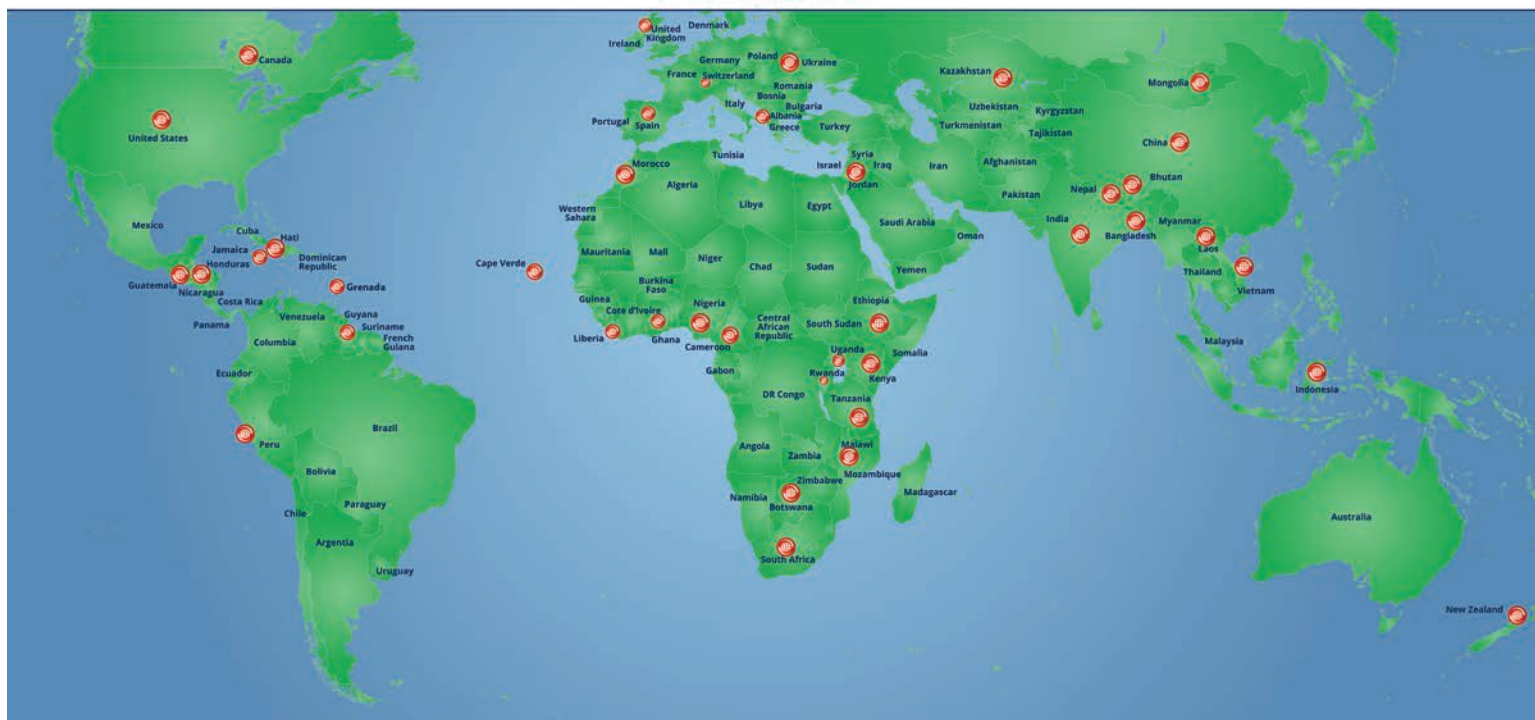
**Heart and stroke patients** need **CT, angiography, and ultrasound** for diagnosis and treatment.

**OVER HALF THE WORLD LACKS RADIOLOGY**

*(Source: World Health Organization)*







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## Letter from Chief Officers

Dear RAD-AID Friends and Supporters,

2020 and 2021 have presented historic shifts in global health, race relations, social justice and health equity. The COVID-19 pandemic has presented many interruptions to global progress, border closures, lockdowns, economic disruption, illnesses and deaths. Although many businesses and nonprofits had to retrench their operations due to COVID-19, RAD-AID pivoted, reinvented and accelerated our programs to fight the pandemic and escalate our global health commitments. Consequently, RAD-AID has emerged stronger than ever before with great hope for a bright future of building life-saving radiological and medical imaging capabilities in low resource regions. This annual report presents a summary of our work so that our community and mission can continue to strengthen for the years to come.

When the COVID-19 outbreak began, our teams were in full motion around the world, working at low-resource medical sites. Our first priority, as always, was to protect the health and safety of our volunteers and partner hospitals. We quickly responded to rapidly evolving travel restrictions and health warnings as more information came available regarding the outbreak. We then flexibly pivoted our charitable operations to closely support and communicate with our partner health institutions. RAD-AID produced and distributed over 2,156 hours of webinar content in 2020 and 2021 for interactive teaching and case-consultations. RAD-AID accelerated donations and shipping of medical supplies, including PPE, high resolution radiology monitors, ultrasound units and more, which fits with our 13-year history of donating over \$15 million to low-resource health institutions. We invested heavily in the RAD-AID Learning Center to expand online instructional content delivery, especially for the many international radiology training programs that were interrupted by the pandemic, across a wide range of topics, including safety and COVID-19 response strategies. The RAD-AID Learning Center instituted high-yield partnerships with American College of Radiology Case-in-Point Series, Applied Radiology, vRad, and many other institutions committed to our global health mission.

Along with COVID-19 were long overdue shifts in race relations in 2020, with heightened visibility of structural racism and social injustices that have challenged health equity for centuries. Disproportionate deaths from COVID-19 and violence, along with higher cancer mortality rates, are just some of the indicators that race plays a powerful role in health equity. RAD-AID has devoted its 13-year history to addressing racial barriers and resource-scarcity to address health disparities. In 2020, we escalated this commitment. We launched the RAD-AID USA Women's Health Program, with support from Hologic, to increase healthcare pathways for women of color in the United States, including breast and cervical cancer screening, education, technology, and patient-navigation. We consequently developed innovative patient outreach models and resources in such locations as Georgia, Washington DC, New York, Denver, Seattle, Arizona, Alabama, Chicago, and others on the way as we launch new sites for healthcare accessibility.

Bridging technology innovation, infrastructure, education, and racial bias, RAD-AID continued to donate and support PACS donations. We received a pivotal grant from Google Foundation to study and address racial bias in radiology artificial intelligence so that RAD-AID can educate and support low-resource health institutions on the safe, effective, and fair use of AI for medically underserved patients. Numerous AI companies and laboratories joined RAD-AID in support of our informatics and AI outreach efforts so that technology innovation can be hand-in-hand with charitable outreach and global health collaboration.

As you view the pages of this annual report, we hope you will recognize the immense work, passion and commitment that RAD-AID volunteers have devoted to this effort. We thank you for taking the time to read about our strategies and passion. RAD-AID continues to grow and contribute to medically underserved populations in low- and middle-income countries as well as underserved communities in high-income countries. We are confident that we will continue to strive, dream and persevere to bring new possibilities to the world.

Thank you for supporting RAD-AID,

Daniel J. Mollura, MD, *President and CEO*

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

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





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**Lauren Fuller**, Chief Financial Officer

(Alphabetical)

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**Jonathan Zember**, Program Manager, RAD-AID Pediatrics  
**Ufara Zuwasti Curran**, Director, RAD-AID Indonesia/Medical Students Program

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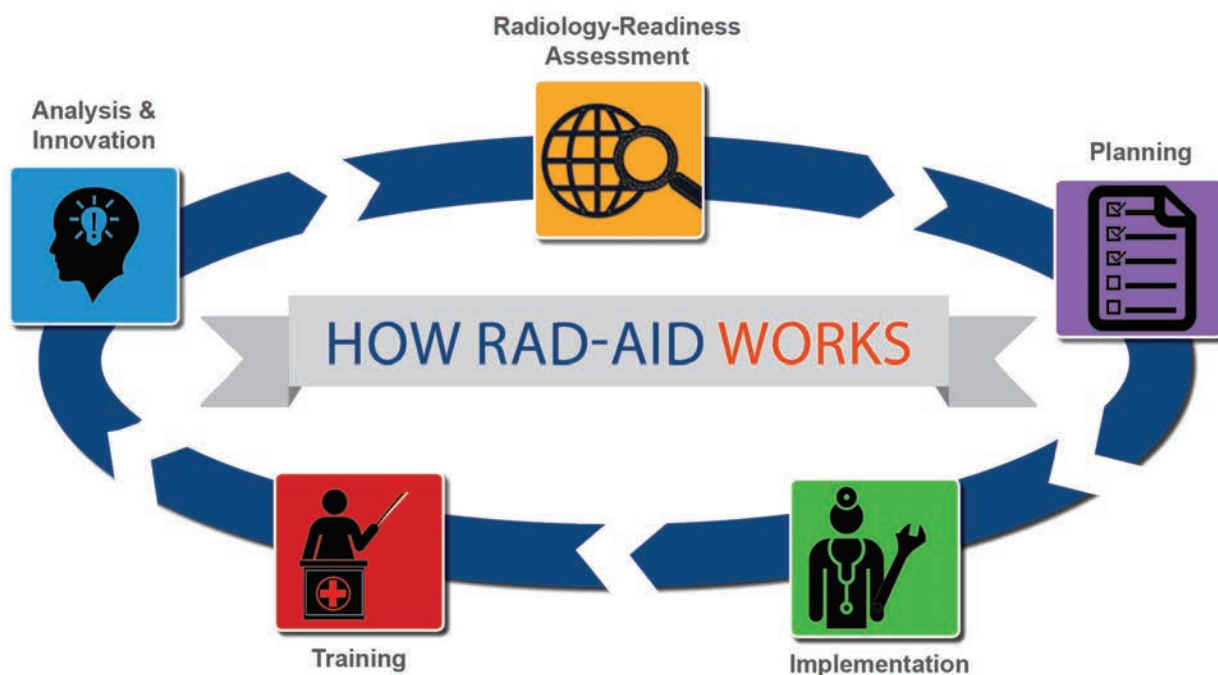
**Daniel J. Mollura (Board Chair)** Founder, RAD-AID International  
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**Liana Watson** - ABII Coordinator, American Registry of Radiologic Technologists  
**Sonnie Dockser** - President, Sonnie Foundation  
**David Youmans, MD** - Diagnostic/Interventional Radiologist Princeton Radiology,  
 Applied Radiology

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**Ryan Sydnor**  
**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 2020-2021, RAD-AID advanced our Radiology-Readiness tool by adding more subspecialty assessment sections, such as Nuclear Medicine and Quality and Safety, which provide great additions to our existing assessments for Informatics, Interventional Radiology, Nursing, Radiation Oncology, and Equipment Planning. 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.



# RAD-AID Central and South America, & Caribbean

## 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. For the last five years, RAD-AID has been implementing new CT services through the donation of two CT scanners (supported by

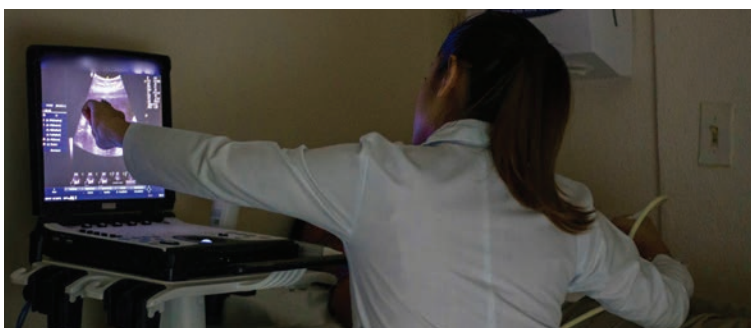
Philips Foundation). In 2020, RAD-AID supervised the construction of the new CT suite at Hôpital La Providence. RAD-AID has opportunities for radiologists, technologists, physicists, nurses, IT professionals and public health specialists to join RAD-AID teams for tele-lecture and on-site work in Haiti. RAD-AID is now assisting Haiti to assess, plan and rebuild after the earthquake of 2021.



*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, Hybrid CT Contrast Training, April 2021



RAD-AID Guyana, Breast Health Care Training, June 2021

## 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 5 radiologists per year. Through an innovative PACS-based tele-education system (RAD-AID Friendship Cloud, details on page 33, 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. RAD-AID signed an agreement with Guyana's Ministry of Health in 2021 to nationally expand medical imaging equipment, PACS, electronic health connectivity, community outreach, as well as clinical education for physicians, technologists and nurses.



RAD-AID installation and donation of PACS (RAD-AID Friendship Cloud) in Guyana, in collaboration with SIIM, Google Cloud, Ambra Health and Tribalco, in May 2019 to advance tele-teaching and global radiology at Georgetown Public Hospital.



First class of Guyana's radiology residents at 2017 RAD-AID Conference, who successfully graduated in 2021 as first-ever in-country trained radiologists.



## 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 next five years.



RAD-AID Jamaica, November 2018.

***RAD-AID's mission is to increase and improve radiology in low and middle-income countries and medically underserved regions of the world.***

## 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 2020-21, RAD-AID is supporting the installation of a CT scanner at Grenada General Hospital, plus delivering educational and clinical assistance to CT technologists, medical physicists, and radiology nurses. Under the leadership of Diana Dowdy, Director of RAD-AID Women's Point-of-Care Ultrasound (photo below), and in collaboration with Intelex, RAD-AID is creating an ultrasound curriculum for midwives and skilled birth attendants for improving maternal health outcomes.



RAD-AID Grenada, Obstetric Emergency Course, October 2019

## 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.



*RAD-AID Guatemala Team at INCAN (led by Mallinckrodt RAD-AID Chapter), September 2016*

## Peru

RAD-AID launch 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.

In 2020-21, 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 Peru, Teaching Breast Ultrasound, January 2020*



*RAD-AID Peru, Ultrasound Training at CerviCusco, January 2020*





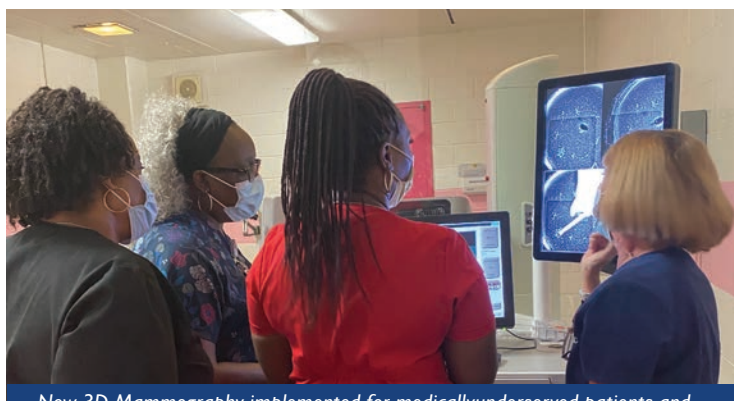
## USA

RAD-AID is rapidly expanding programs in the US for rural and urban 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 xx for details on our chapters), RAD-AID has outreach programs for rural and urban populations facing health care shortages. Since 2017, 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. The RAD-AID University of Alabama Chapter provided fundamental POCUS training to family medicine residents, medical students, and physicians in Selma, Alabama.

In 2020-2021, we launched the 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 innovative 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 gaps and barriers in health services.



University of Alabama RAD-AID Chapter, Delivering POCUS Training in Selma, Alabama, June 2021



New 3D Mammography implemented for medically underserved patients and community on the south side of Chicago in RAD-AID USA Women's Health site, Jackson Park Hospital (2021)

## Canada

RAD-AID is actively developing programs for northern regions of Canada where health resources are scarce in remote locations. Since 2017, RAD-AID Chapters have grown in Canada (see page 32 for more on our Chapters Program) for Canadian radiology professionals to receive grants, mentorship and projects. In 2020, RAD-AID launched a partnership with the Canadian Hub for Applied and Social Research (CHASR) at University of Saskatchewan, to use geographic information systems (GIS) for measuring health care disparity and strategize radiology health care delivery in Canada as well as many RAD-AID sites in low and middle income countries. RAD-AID has a partnership with Sonography Canada for global health outreach. RAD-AID is partnered with 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.



RAD-AID Ultrasound Team Presenting at the Sonography Canada Conference, May 2019



### Ethiopia

The RAD-AID's 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 2020, RAD-AID instituted remote tele-lecture and case-based sessions with Ethiopian partners on breast imaging and ultrasound. In 2021, RAD-AID signed an agreement to donate PACS to the University of Gondar College of Medicine and Health Sciences, to advance radiology development in Northern Ethiopia.



RAD-AID Ethiopia in Addis Ababa Providing Didactic Training, February 2020



RAD-AID Nursing Providing Training in Addis Ababa, February 2020

***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.***



## 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 2021 donation of high-resolution radiology monitors (supported by vRad).

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, and pediatrics. To help Ghana's radiology residency programs interrupted by the COVID-19 outbreak in 2020-21, RAD-AID instituted tele-teaching programs bridging Ghana's academic training programs, and collaborated with the Ghana Association of Radiologists (GAR). RAD-AID Ghana also supports Eastern Regional Hospital (Koforidua) and Komfo Anokye Teaching Hospital (KATH). In 2021, RAD-AID partnered with Society of Nuclear Medicine and Molecular Imaging (SNMMI) to expand nuclear medicine at KBTH and create a nuclear medicine Readiness Assessment tool applicable to all RAD-AID global sites seeking to strengthen molecular imaging.



*RAD-AID Ghana, at Korle Bu Teaching Hospital, September 2019*



*RAD-AID Kenya, Interventional Radiology Simulation Training with Support from Mentice at the University of Nairobi, November 2019*

## Kenya

The RAD-AID Kenya program is a multifaceted collaboration to assist breast imaging, interventional radiology, radiation oncology, and informatics. In 2020, RAD-AID Kenya implemented the first interventional radiology fellowship program in Kenya with University of Nairobi (UoN). In 2021, 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. RAD-AID Kenya 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 2020-2021, RAD-AID established partnership and educational symposiums with the Kenya Association of Radiologists. 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. Numerous academic partners and RAD-AID chapters contributed to tele-teaching for Kenya during the COVID-19 pandemic, covering medical physics, pediatric imaging, and breast imaging, such as Memorial Sloan Kettering and Wake Forest University.



## Tanzania

RAD-AID Tanzania began in 2015 to help address severe radiology personnel shortages. Tanzania has nearly 60 radiologists to care for 58 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, radiologic nurses, interventional radiologists, and radiologic technologists in Arusha (NSK Hospitals), Moshi (Kilimanjaro Christian Medical Centre - KCMC), and Dar es Salaam (Aga Khan Hospital and Muhimbili National Hospital). In 2020, RAD-AID delivered advanced CT training to staff and radiology residents at Muhimbili National Hospital and KCMC, along with comprehensive ultrasound curriculum development at KCMC. In 2020-21, RAD-AID delivered MRI training to support KCMC's first ever and recently acquired MRI unit, including an 8-week MRI safety course. To help fill shortages of local instructors for KCMC's residency during the pandemic, RAD-AID delivered daily lectures and clinical case presentations to KCMC's radiology residents. RAD-AID announced a partnership with the East African Medical Assistance Foundation (EAMAF) in 2021 to enhance equipment-donations with robust clinical training for KCMC. In 2021, RAD-AID implemented a donation of handheld breast imaging ultrasound units (supported by Hologic) and high-resolution diagnostic monitors (supported by vRad).



RAD-AID Tanzania in Moshi, February 2020

## 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 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. RAD-AID partnered with the Malawi Children's Initiative (MCI) for pediatric and maternal-infant imaging. In 2020, RAD-AID Malawi donated personal-protective equipment (PPE) to Malawian hospitals fighting the pandemic, gave grant funding to boost Malawi's internet-connectivity, and implemented a longitudinal ultrasound course. RAD-AID has supported the Malawi College of Health Sciences, Kamuzu Central Hospital, and Partners in Hope, located in Lilongwe.



RAD-AID Tanzania in Dar es Salaam, January 2020



RAD-AID Malawi, Teaching Pediatric Ultrasound, March 2020

## 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.

***RAD-AID has numerous programs throughout the world.  
We welcome you to participate!***



RAD-AID Cape Verde, X-Ray Radiographic Interpretation, 2017



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

## 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 2020-2021, RAD-AID implemented remote didactic and case-based sessions, which were regularly attended by over one hundred Moroccan radiology professionals.





*RAD-AID Nigeria Team for PACS Installation, University College Hospital, Ibadan, August 2019*

## 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, Nigeria. In 2020-2021, RAD-AID launched an artificial intelligence educational collaboration with UCH, in addition to ongoing clinical educational activities. In September 2021, Dr. Farouk Dako, Director of RAD-AID Nigeria, gave the keynote lecture at the Association of Radiologists in Nigeria (ARIN) annual meeting in Abuja, Nigeria.



*RAD-AID Nigeria, Interventional Radiology Training, February 2020v*

***We continue to seek motivated individuals who are interested in the long term advancement of radiology in Nigeria.***

***The current goals of the program include 1) optimization of imaging enterprises and 2) development of sub-specialty training programs.***



## Liberia

The RAD-AID Liberia program supports radiology development and education at JFK Memorial Hospital, Redemption Hospital, ELWA, Phebe, and JFD-Tappita Hospital for the last five years. 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.



*RAD-AID Liberia, Lead Apron Donation Supported by Burlington Medical, May 2020*



*RAD-AID Liberia, Chest Radiography Education, January 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. In 2020, RAD-AID implemented the donation of handheld breast imaging ultrasound units (supported by Hologic), that were distributed amongst 5 strategic locations, including the non-profit Hlokomela in the Limpopo region.

## Botswana

RAD-AID launched a new program in 2020-2021 to support radiology infrastructure, PACS, and education at Princess Marina Hospital (PMH) and Sir Ketumile Masire Teaching Hospital in Gaborone, Botswana. The program plans to address the multilevel gaps in availability and accessibility of radiology services, as outlined in the Radiology Readiness Assessment. The RAD-AID University of Pennsylvania Chapter is a significant contributor to the RAD-AID Botswana program.



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

## Jordan/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.

## 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.



Partners to RAD-AID Peru from the University Hospital Morales Meseguer (Spain), February 2020



RAD-AID Albania, International Multidisciplinary Medical Congress, 2018

***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.***



## 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. RAD-AID Nepal's 2019 project mission included the advancement of PACS and ultrasound education at partner institutions in Kathmandu.



RAD-AID Nepal, at Hospital and Rehabilitation Center for Disabled Children, September 2019



RAD-AID Nepal, September 2019

## 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.



RAD-AID Bhutan

## 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 program in Mongolia. RAD-AID conducted a Radiology Readiness Assessment for a primary care facility in Mongolia's capital city, Ulaanbaatar. Current program activities include radiologic technologist education, radiation safety, MRI protocol optimization and medical imaging educational curriculum development.



*RAD-AID Mongolia, Technologists from Intermed Hospital, June 2021*

## India

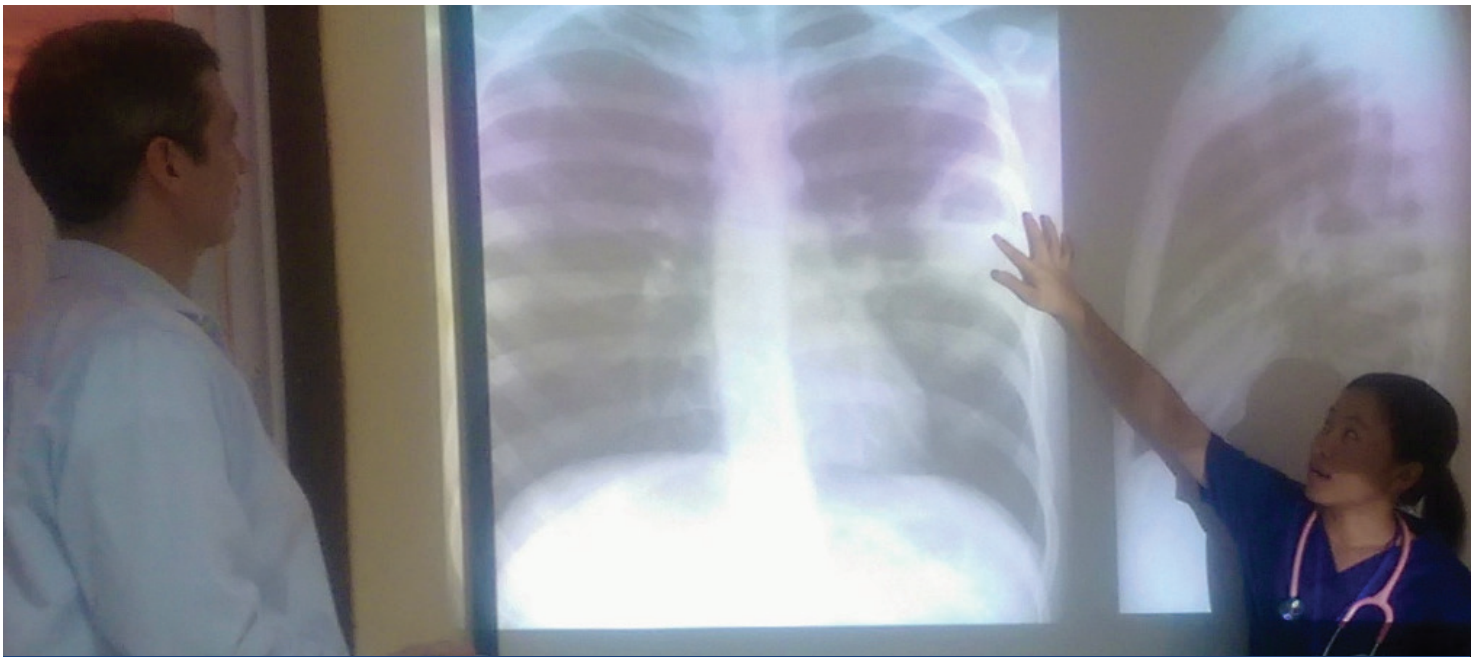
RAD-AID's work in India began in 2010 with the establishment of Asha Jyoti ("Ray of Hope" in local Punjabi language) in the innovation of a specially designed mobile women's health clinic for osteoporosis, breast cancer and cervical cancer screening of marginalized women in Northern India. Surpassing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

2021, RAD-AID provided remote support to COVID-stricken areas of India, and signed an agreement with Nair Hospital in Mumbai to provide long term educational collaboration for radiology, medical and nursing staff.



*Patients waiting for PGIMER Chandigarh RAD-AID mobile women's health clinic, Asha Jyoti ("Ray of Hope") in Northern India*





*RAD-AID Laos, Pediatric Chest Radiography Education, May 2015*

## 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 services that never existed before in the hospital. 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, Tribalco and SIIM. Ongoing efforts in Laos are focused on educational efforts in ultrasound, radiography, and CT.



*RAD-AID Laos, Pediatric Ultrasound Training, September 2017*



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

## 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 Vietnam, Interventional Radiology Simulation Training, April 2019



## 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. The RAD-AID Bangladesh program is building educational opportunities across all modalities and specialties of imaging. In 2020-21 and in response to COVID-19, RAD-AID launched a partnership with the Bangladesh Society of Radiology and Imaging (BSRI) to institute webinars on radiology education, which were attended by numerous radiology professionals across the country.



RAD-AID Bangladesh, 2020



RAD-AID Bangladesh, Ultrasound Breast Biopsy Training, 2020



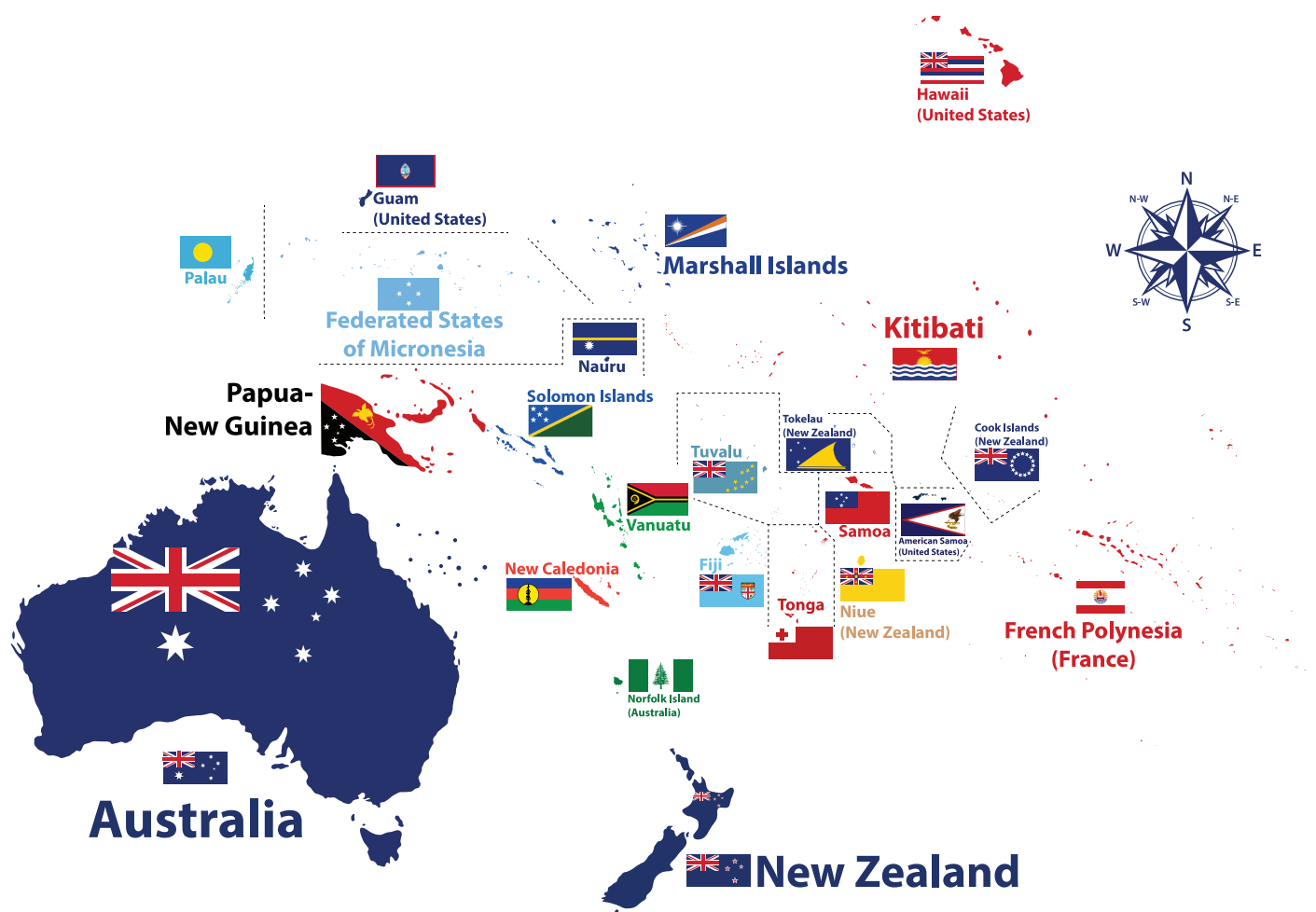
RAD-AID collaborated with ACR to donate the BIRADS Atlas to support mammography in Indonesia at Rumah Sakit Cipto Mangunkusumo (RSCM) and its affiliated Faculty of Medicine Universitas Indonesia (FKUI)

## 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 and pediatric imaging webinars in 2020-21 to help sustain educational efforts during the COVID-19 pandemic. 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 has grown to include more than 14,000 volunteers from 146 countries, 83 university-based chapter organizations, on-site programs in 38 countries, and an annual conference on global health radiology.**



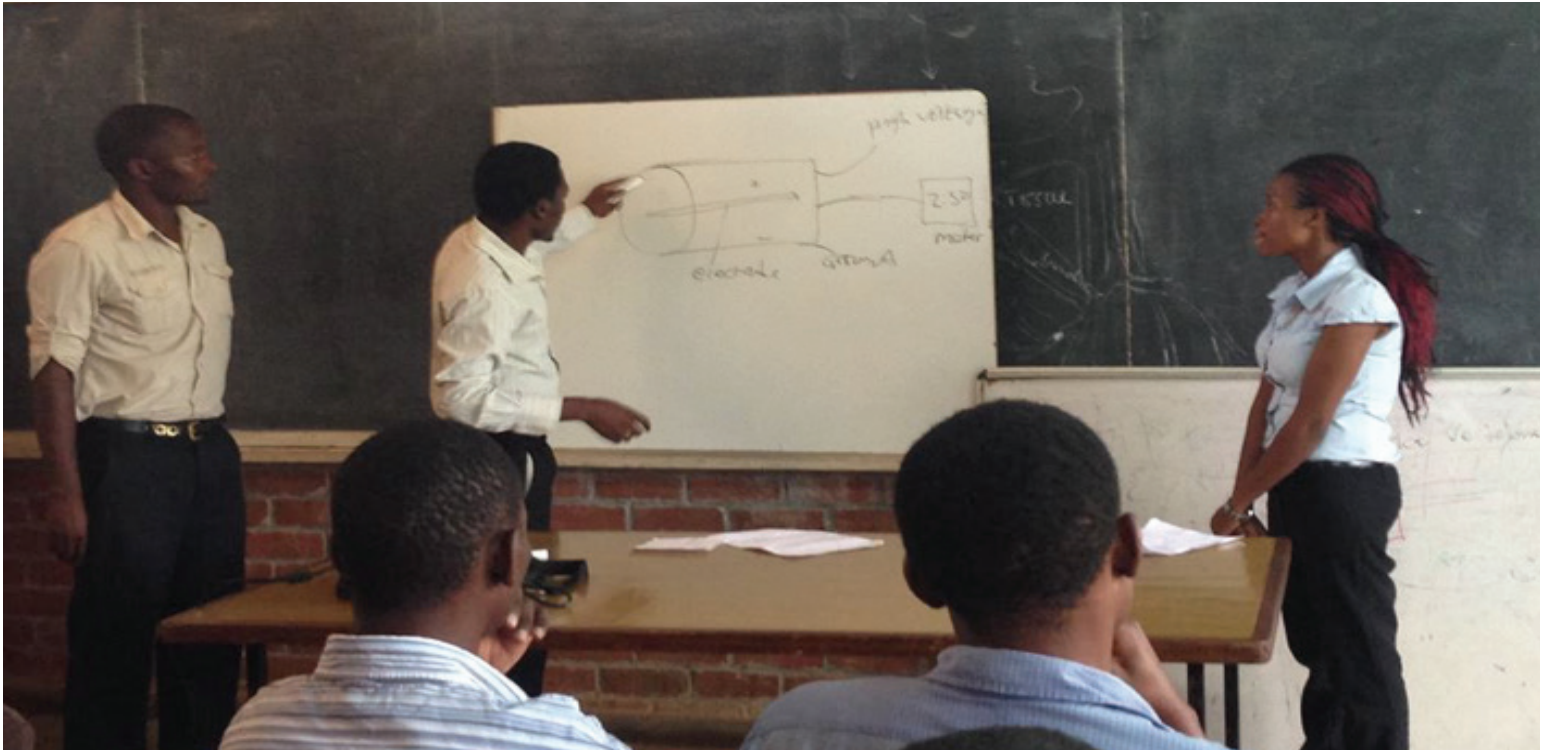


RAD-AID launched the South Pacific program to address health disparities and lack of radiology resources.

## Samoa







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 in one of the few radiology centers on the island of Samoa, which revealed limited availability of radiology equipment and personnel. The RAD-AID South Pacific Program is currently expanding to include outreach in Vanuatu and the Cook Islands. RAD-AID is also responding to requests for radiology education assistance from Fiji and Tonga.

***RAD-AID's radiology outreach programs are designed on the principle of bringing vital health services to populations in need, with a focus on critical imaging services for essential health care.***



*RAD-AID Malawi Team Teaching Radiographic Techniques in Lilongwe, 2016*

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. In 2020, the RAD-AID Learning Center expanded to increase the quantity of content available to our partner institutions. Over 300 new learning modules were uploaded to RAD-AID Learning Center in 2020-21.
-  **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 lectures, discussions and project mentorship.
-  **Medical Student Global Health Education** program at RAD-AID offers an online course so that students may receiving 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. 75 Medical Students have matriculated as of mid-2021.
-  **RAD-AID Chapters Network**, now consisting of 83 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 Haiti, Teaching Radiographic Imaging Techniques, 2015*







*RAD-AID Haiti, Teaching Ultrasound, 2014*



*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 features of countries.
-  RAD-AID Conference – a unique international radiology forum - annual since 2009 and now in its 13th year. In-person conferences have been hosted by the World Health Organization in Washington DC. CME and CE credits for physicians and technologists provided by ACR. Contact Hours for nurses provided by Virginia Nurses Association.
-  Sub-specialty assessment tools have been added to our general Radiology-Readiness tool, such as interventional radiology, informatics, nursing, radiation-oncology, breast imaging, ultrasound, equipment planning and more, along with translation into four languages.

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





## ANNUAL RAD-AID CONFERENCE: 13 YEARS



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

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. In 2020 and 2021,

RAD-AID hosted a two-day virtual conference, which enabled over 500 registrants to participate from all corners of the world. The conference is essential for RAD-AID as a central insight and vision-formation event that sets the plans in motion for the following year. 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.***



## INTERDISCIPLINARY INITIATIVES

### Informatics & Health IT

RAD-AID has implemented and managed digital radiology, health IT and PACS in over 12 countries. We provide advanced pro bono training on medical software applications to low-resource hospitals and in-country IT professionals. In 2020-2021, RAD-AID sustained assistance to low-resource hospitals during the COVID-19 pandemic through a PACS-based teaching and consultation platform, such as in Guyana and Laos. Over the past year, RAD-AID accelerated its artificial intelligence (AI) donation program, using a **Teach-Try-Use** model of providing AI education, installing infrastructure for piloting AI, and then gradually scaling up clinical use of AI, respectively. AI, PACS and Cloud companies, such as Ambra Health, Densitas, Google Cloud, IBM Watson Health Imaging, Koios Medical, and Qure.AI, have generously contributed to the RAD-AID Informatics program.

### Nursing

Nursing is 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 to detect and manage obstetric emergencies.

### Interventional Radiology

RAD-AID supports interventional radiology training for fellowship programs and hospitals in Guyana, Nicaragua, Ethiopia, Ghana, Tanzania, Vietnam, Kenya, and Nigeria. In 2020-21, 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.

### 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.



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



RAD-AID Nursing, ACLS/BCLS Training for Radiology Staff and Residents, Guyana, November 2018

***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 Nursing, CT Contrast Reaction Code Drills, Guyana, May 2021*

### **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.

### **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, with other sites in development.

***Global health and radiology are constantly evolving, and RAD-AID makes sure to stay at the forefront of these changes to increase access to care. We never stop innovating.***



*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	MD.ai
Ambra Health	MedWeb, Inc.
American Association of Medical Dosimetrists (AAMD)	Mentice, Inc.
American College of Radiology	IBM Watson Health Imaging (Merge)
Association for Radiologic and Imaging Nursing (ARIN)	Nurses with Global Impact
American Society of Radiologic Technologists (ASRT): Supports ASRT members in RAD-AID teams/projects	Philips
Aperian Global	Philips Foundation
Applied Radiology	Project Hope
Bayer	PURE
Black Women's Health Imperative	quire.ai
Breast Care for Washington	Radiology Partners (RP)
Canadian Association of Medical Radiation Technologists (CAMRT)	Siemens Healthineers
Center for Accelerated Real Time Analytics (CARTA)	Society of Breast Imaging (SBI)
CerviCusco	Society for Imaging Informatics in Medicine (SIIM)
Canadian Hub for Applied and Social Research (CHASR)	Society of Interventional Radiology (SIR)
Clinton Global Initiative	Society of Nuclear Medicine and Molecular Imaging (SNMM)
CureMetrix	Society and College of Radiographers (United Kingdom)
Densitas	Sonography Canada
East Africa Medical Foundation	Straightline Aviation
Envision Physician Services	Therapixel
Friends Without a Border	Tribalco
Google Cloud	Virtual Radiologic (vRad, a Radiology Partners Company)
Google Foundation	World Federation of Pediatric Imaging (WFPI)
Hexarad Radiology	World Health Organization (official relations status since 2015)
HI-IQ	
HIMMS	
Hologic, Inc.	
Inteleos	
Koios Medical	





## RAD-AID CHAPTERS NETWORK

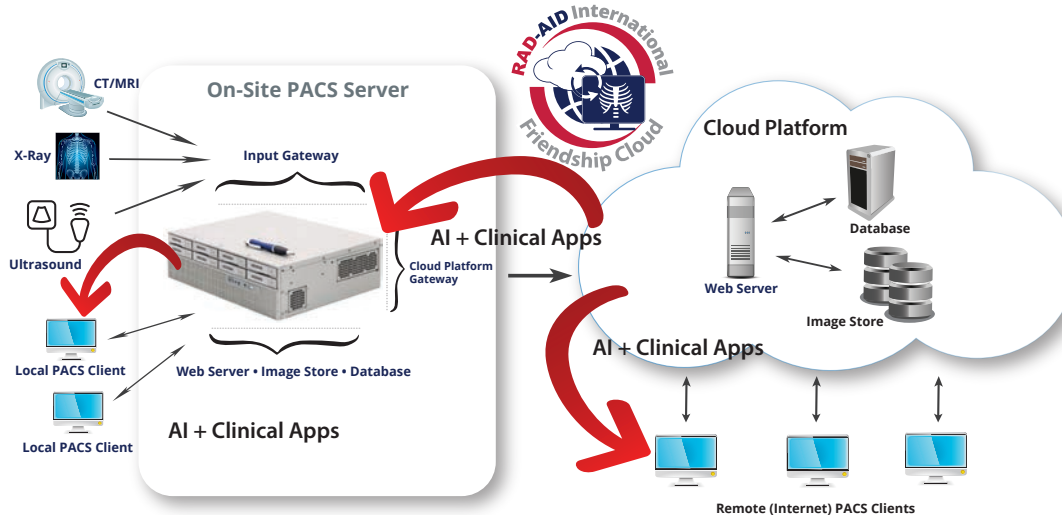


UT Health McGovern Medical School RAD-AID Chapter in Morocco, 2019









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 83 chapters by early-2021. Learn more about RAD-AID Chapters online to apply, establish, grow or renew your chapter.





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).



***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

of Washington DC. In 2019, we also supported mobile programs in Morocco and Ukraine. In 2020-21, 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.



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



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.



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.



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



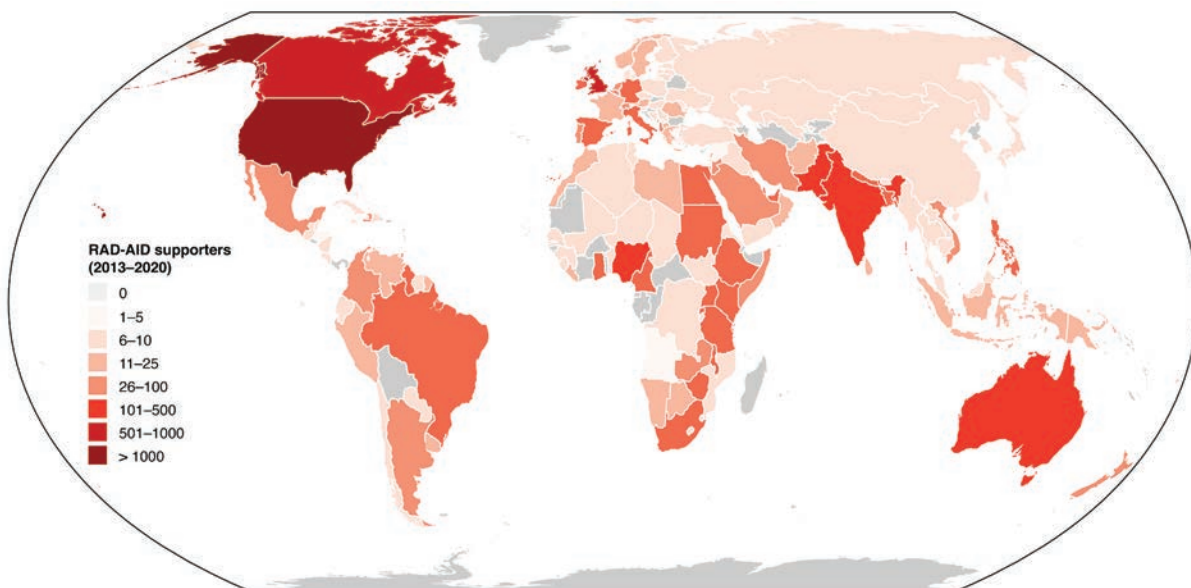
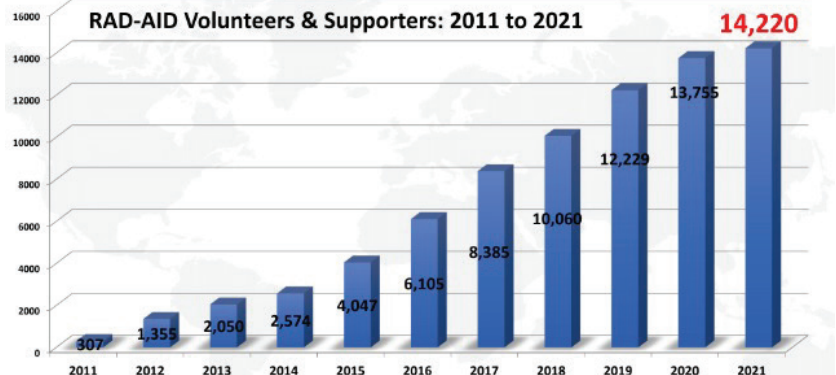
RAD-AID Medical Airship photo based on collaborative trip with Lockheed Martin to Ghana, 2017

RAD-AID received a perfect score from Charity Navigator in 2021 and Gold Rating of Transparency from GuideStar every year since 2017. Our members, supporters, donors, volunteers and the general public can always find detailed information about RAD-AID's stewardship of financial and in-kind donated resources at our website. Over the last 5 years, RAD-AID's administrative costs have been less than 10% of total expenses. Each dollar of your donated money, minute of your donated time, and ounce of your donated equipment is very valuable to us at RAD-AID as we strive to accomplish our mission. We thank you for your support and contributions. Here are some financial highlights of the 2020-2021:



***RAD-AID received a perfect score from Charity Navigator in 2021, a Gold Seal of Transparency from Guidestar from 2017 to 2020, and a Platinum Seal of Transparency from Guidestar in 2021.***

## END OF YEAR NET ASSETS



**RAD-AID's volunteers and supporters are from 146 countries.**





## Conclusion and Thank you!

We hope this 2020-2021 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 14,000 volunteers from 146 countries helping over 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*



# **RAD-AID.org**

*Radiology serving the world*



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rad-aid-international



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