ARMAUER HANSEN RESEARCH INSTITUTE

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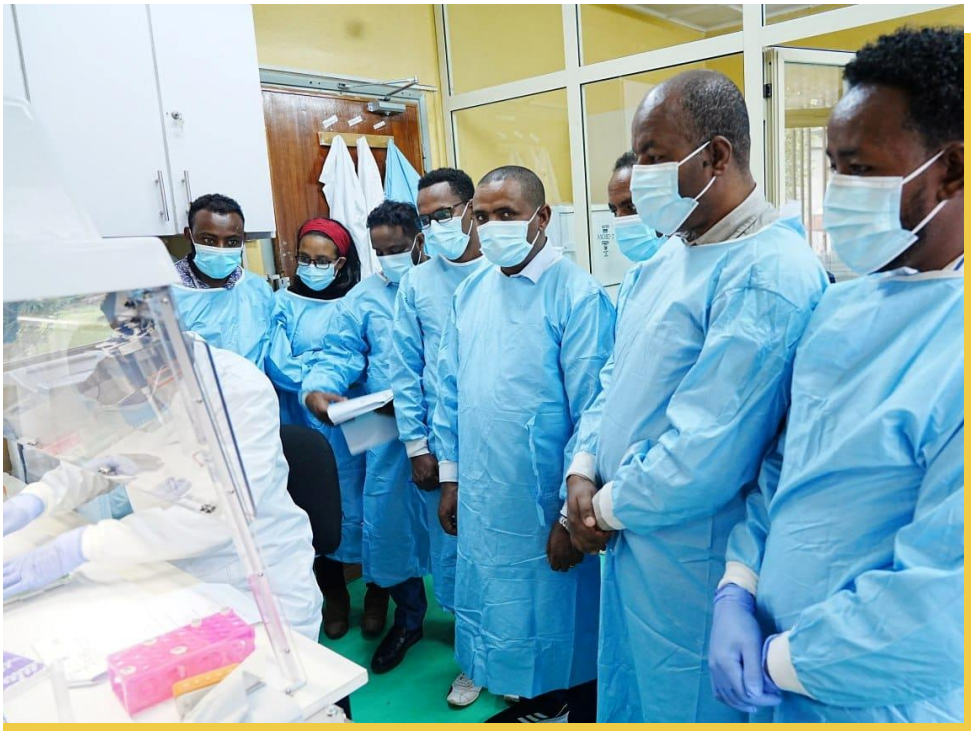

Annual report 2022/23

CONTENTS

List of acronyms

AHRI	Armauer Hansen Research Institute
E.C	Ethiopian Calendar
EFDA	Ethiopia Food and Drug Authority
IFMIS	Integrated Financial Management Information System
eGP	Electronic Government Procurement
EFY	Ethiopian Fiscal Year
ERP	Enterprise Resource Planning
GCP/ GCLP	Good Clinical Practice/ Good Clinical Laboratory Practice
MoH	Ministry of Health
MOU	Memorandum of Understanding
TB	Tuberculosis
WHO	World Health Organization

Executive summary

In line with the mandate that was given to it by the Ethiopian Government, AHRI has continued to be actively engaged in biomedical research. This report summarizes the research activities and outputs of AHRI in the 2022/2023 calendar year. In addition, activities that emanated from the new extended mandate have been included in relevant sections even though not reflected in outcome and output summary tables. The report is intended to communicate AHRI's research findings and transfer of new or improved technologies to policymakers, the community, healthcare professionals, the private sector, and other stakeholders in the form of research digest, policy, issue briefs, and prototypes.

During the reporting period, two policy briefs titled, "Leprosy patients remain hidden and undiagnosed - Call for action", and "mHealth intervention for better maternal & neonatal health in pastoralist communities" were prepared and submitted to the Federal Ministry of Health (MoH).

The two issue briefs that were prepared and submitted to the Ministry of Health for policy considerations were: "Curb pneumonia deaths with low cost locally made oxygen device (BCPAP)" and "Integrating physical and psychosocial care for People with Podoconosis, lymphatic filariasis, and leprosy in Ethiopia" An advocacy workshop was conducted with stakeholders from the House of People representatives (Social affairs, Sport, Health, and Culture standing committee), Office of the Prime Minister, and the Federal Ministry of Health. The discussion focused on the mechanism for the uptake of evidence-based decision-making in the health sector and beyond. In addition, six consultative meetings have been conducted with stakeholders from federal agencies, Regional Health Bureaus, Science and technology offices, and universities. The objective of these consultative meetings was to bring onboard multi-stakeholders for convening and brainstorming about the ongoing health research projects. Furthermore, another stakeholders meeting was conducted with pharmaceutical manufacturing industry representatives focusing on familiarizing the new mandate of AHRI and strengthening partnership in the sector.

The Institute conducts research in basic biomedical, clinical, translational, clinical trial, traditional and modern medicine, vaccine and diagnostics, and operational studies for the control and prevention of infectious and non-infectious diseases and also for developing technologies and/or technological solutions. Besides many ongoing projects, AHRI researchers were able to acquire competitive grant support to perform projects such as the SOLIDARITY Plus trial for the treatment of COVID-19 Patients (funded by WHO); Molecular dissection of leprosy immunopathology to inform the use of novel therapeutics (funded by Dioraphte); APOPPO II, Enhancing TB Detection using Hero Rats (funded by the Government of France); A holistic approach in patient management and epidemic surveillance through convergence of diagnostic technologies, capacity building and stakeholder engagement (HoliCare) (funded by the EU); Developing strategies for hepatitis C in Ethiopia (DESTINE) (funded by NIHR); Improving maternal health outcomes in Ethiopia by integrating point-of-care testing for sexually transmitted infections in antenatal care (IMPRESS) (funded by VLIR-UOS); OptiVivax- Optimizing a High Efficacy *Plasmodium vivax* Malaria Vaccine (funded by the EU); Drivax: What drives *Plasmodium vivax* transmission in incident or relapsing infections (DRIVAX)(funded by the Wellcome Trust) and a Brucellosis project funded by Geigy Foundation.

Non-communicable diseases research projects in the areas of breast cancer, cervical cancer, lymphoblastic leukemia, myeloid leukemia, and podoconosis are progressing very well. Very good

progress has also been made in the study of the impact of COVID-19 on patients with diabetes, and the development of a mobile app that could be used to self-monitor diabetes.

As a testament to the increasing capacity in genomics and bioinformatics at AHRI, sequencing was performed on 784 malaria parasites and 285 bacterial isolates. In addition, by the SUPER project, 1525 SARS-CoV-2 samples were sequenced.

The study on the use of bubble continuous positive airway pressure (BCPAP) for the treatment of children aged 1–59 months with severe pneumonia and hypoxemia in Ethiopia was completed and the results were disseminated to national stakeholders including MoH.

Traditional Medicine research projects, including the Ethnomedicinal survey that intends to set traditional medicine standards, alternative traditional medicine studies for diabetes management are being conducted and phytochemicals screening is being performed. Major compounds were undergoing isolation approaches for three traditional medicines for hypertension; similarly, GSMS analysis was performed in the mosquito repellent study.

During the budget year 22,704 doses of rabies vaccines were produced and distributed to most of the regions and city administrations. An assessment was completed for establishing Fermi vaccine distribution hubs in Oromia National Regional State, South Nation and Nationalities People Region, Sidama National Regional State, Amhara National Regional State and Somali National Regional State.

Two pharmaceutical industries (AFRICURE ETHIOPIA & GLOCARE Ethiopia) were promoted to the production stage in the budget year by providing support on GMP implementation, expansion project monitoring and evaluation, and national pharmaceutical production priority. These actions were taken in order to increase the productivity of the pharmaceutical industry. An input-output coefficient implementation manual was also prepared.

Through the Grand Challenges Ethiopia Scheme which aims to promote local health innovations, support was provided to 10 Transition to scale projects. In addition, in the budget year, a guideline for the National Health Innovation Steering Committee which will be involved in solving problems faced by innovators and facilitates the production and use of the innovations was prepared. A total of 84 scientific manuscripts were published during the current fiscal year.

Research training for post graduate students (MSc, Ph.D.) is one of the key missions of AHRI: In this reporting period, 10 of our graduate students successfully defended their thesis of which 4 were Ph.D. students and 6 were MSC students. AHRI also accepted 10 new students from different universities, bringing the total number of Ph.D. and Masters Students to 84. There are 58 Ph.D. students, 14 female and 42 male, and 26 MSC students, 18 male and 8 female. Twelve supplementary short-term trainings were conducted in this reporting period. Among many, these include: Hands-on Grant Writing Course DGD Framework Agreement 5 Ethiopia and Alliance, Mentorship and Women in Carrier Path, Grant Writing and Development, Advanced Red Cap, Instructional Design, and Others. A total of 210 participants, including AHRI students, researchers, and staff, as well as those from partner institutions, attended training on 9 topics.

The construction of the new building is ninety nine percent completed and the redesigning of the branch at Adama is finalized. AHRI has also automated its financial and procurement proceedings for work efficiency. Also maintenance and repair of laboratory equipment is ongoing.

The regular budget allocated from the federal treasury was 290,139,600 ETB and 175,843,334 ETB (60.6%) was utilized. There was 328,950,428 ETB allocated for spending from Norad (54,443,704 ETB) and other competitive grants. A total of 311,876,769 ETB (95%) was utilized during the fiscal year with an overall expenditure rate of 79% from all sources. There were 258 major activities planned during the reporting period; of these, 203 were achieved in the green category (completion of $\geq$ 80% of activities), 14 yellow (below 80% and above 55%) and 41 red (55 and below). The overall annual physical performance of the institute was 88.6%.

Methodology clarification

Targets for the reporting period and the next year were taken from the respective yearly targets of the ten-year strategic plan of AHRI. Output indicators of each outcome are shown in tables preceded by explanations of major activities and followed by descriptions of the output indicators. The reporting period covers from July 01, 2022 to June 30, 2023. A report preparation team consisting of experts representing different thematic areas was established to collect data and write up the report. In addition to gathering technical narrative information and annexes from the different directorates and executive offices of the Institute, substantial information was taken from Amharic version of the EFY 2022-23 annual report.

Outcomes of AHRI extracted from '2020/21 to 2029/30' ten-year strategic plan

Outcome 1: Increased uptake of research findings by the public and policy makers.
Outcome 2: Improved medical research participation, skill and research culture.
Outcome 3: Improved public engagement in planning, implementation and M&E.
Outcome 4: Improved effectiveness and efficiency in fund management.
Outcome 5: New knowledge generated and new/improved tools developed.
Outcome 6: Improved medical research capacity.
Outcome 7: Improved quality assurance system.
Outcome 8: Improved performance of program/project management.
Outcome 9: Improved networking, information resource access and institutional visibility.
Outcome 10: Improved performance of human resource management and governance system.
Outcome 11: Improved capacity and effectiveness of institutional infrastructure.

Outcome 1: increased uptake of research findings by the public and policy makers

AHRI intends to communicate its research findings and transfer new or improved technologies to policy makers, community, health care professionals, private sector and other stakeholders in the form of research digest, policy and issue briefs, and prototypes using different platforms.

During the reporting period, three policy briefs:- Leprosy Patients remind hidden and undiagnosed: Call for action, mHealth intervention for better maternal & neonatal health in pastoralist communities and two issue briefs:- Curb pneumonia deaths with low cost locally made oxygen device (BCPAP) and; Integrating physical and psychosocial care for people with podoconiosis, lymphatic filariasis and leprosy in Ethiopia were prepared and submitted to the Ministry of Health for policy considerations.

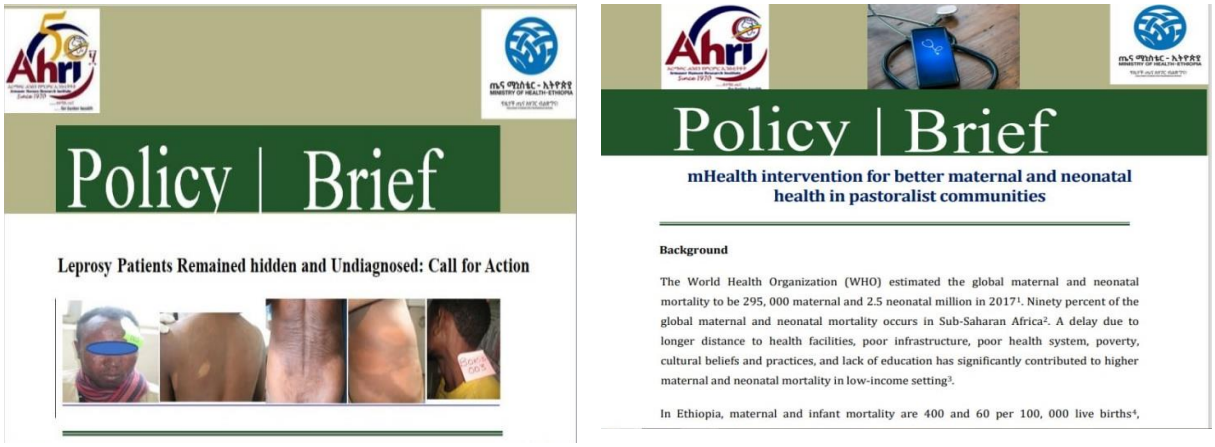

Figure 1: A partial outlook picture of Policy Briefs prepared and submitted

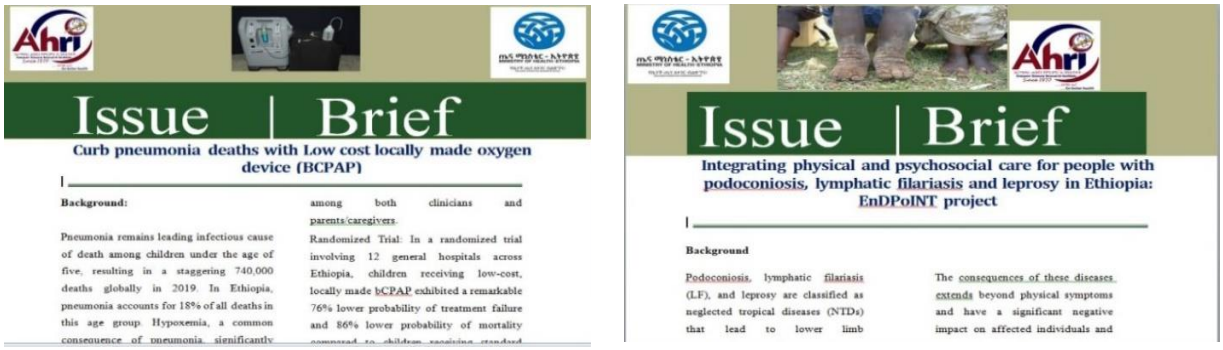

Figure 2: A partial front page of Issue Briefs prepared and submitted in 2022/23

There was one consultative meeting conducted with stakeholders from house of people representatives, Social Standing Committee and Ministry of Health representatives. The discussion focused on the mechanism for the uptake of evidence- based decision making in the health sector and beyond.

Annual regular conference was held on TB research advisory council (TRAC) with the motto YES! WE CAN END TB / harnessing local evidence to end TB. In addition, a dissemination seminar on the study of Bubble continuous positive airway pressure (BCPAP) for the treatment of severe pneumonia in young children in Ethiopia; STREAM Stage 2 week 76 Result dissemination to national stakeholders; community based non laboratory CVD risk assessment by HEW study result dissemination was held with various representative officials from the PM Office, Parliament, MOH, RHBs, researchers, and other stakeholders.

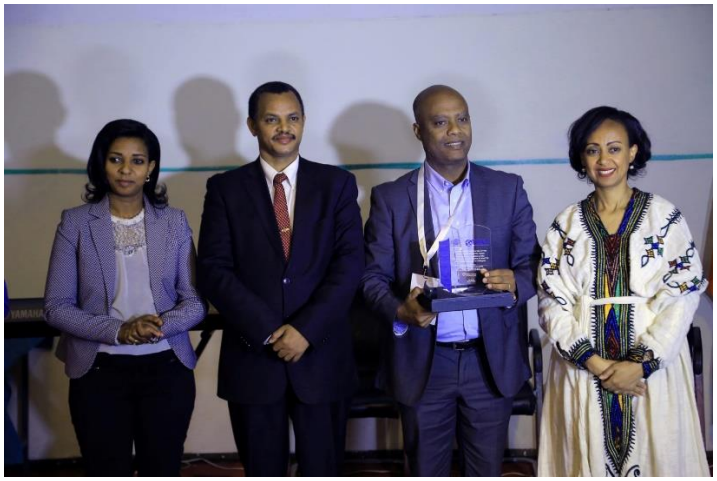

Figure 3: HE, Dr. Liya Tadesse recognizing AHRI's long years of service on TB research on the occasion of the 17th TB Research Annual Conference (TRAC) held in Gondar

The first conference of Southern and East African Regional Network for Tuberculosis (SEARN-TB) was organized and conducted by AHRI in May, 2023. SEARN TB aims to strengthen coordination and harmonization of TB control approaches with a particular focus on promoting implementation and operational research and the efficient use of research outcomes to strengthen TB control throughout the region. The Network emphasized concerted efforts by academia, research institutes, health service delivery institutions, pharmaceutical manufacturing organizations, partners for health development, the public and other related regional networks are needed to achieve results and to sustain the impacts. The Director General of AHRI, Prof Afework Kassu, affirmed that Armauer Hansen Research Institute is committed to continue sharing experiences of Tuberclosis Research Advisory Conference (TRAC) to contribute towards tuberculosis control in Ethiopia, Africa and beyond.

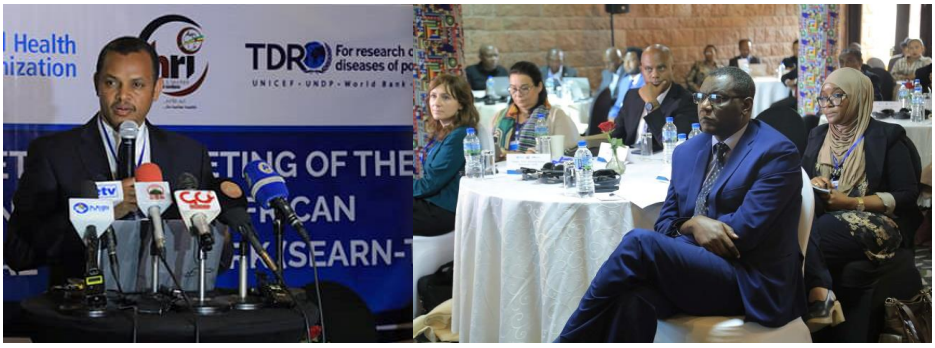

Figure 4. SEARN-TB Establishment meeting, Addis Ababa, Ethiopia

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
1.1	Number of research finding dissemination forums	4	4	4
1.2	Number of issue briefs submitted	2	2	3
1.3	Number of policy briefs submitted	2	3	1
1.4	Number of new/improved technologies transferred	2	1	N/A

Summary assessment by outcome 1, performance indicators:
Number of research finding dissemination forums: forums conducted by the organization for research dissemination per year

Number of issue briefs submitted: A short summary of research finding, knowledge or synthesis on issue/problem related to public health importance.

Number of policy briefs submitted: Concise summary of a research result, the policy options to deal with it, and some recommendations on the best option.

Number of new/improved technologies transferred: New technology developed locally or improved technology that is invented elsewhere, adapted and transferred.

Outcome 2: improved medical research participation, skill and research culture

During the reporting period, AHRI supported short- and long-term research trainings. There were 84 MSc and PhD trainees who carried out their research in AHRI. There were 10 long-term trainees graduated during the reporting period. Furthermore, 210 researchers were trained in various research training topics. Topics of the short-term trainings and the respective trainees were Research Ethics (25), Instructional Design (15), Grant Writing and Management (28). NGS Library Preparation and Sequence Analysis (28), Data Analysis (11), Advanced Molecular Biology Technique (20), Grant Writing (9), Good Clinical Practice (24), Training of Trainers (TOT) (18), and Mentorship Training (13). A total of 56 partners including funders, local and international universities and institutions collaborated with AHRI during the year.

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
2.1	Number of trainees (long-term and short-term)	310	294	365
2.2	Number of institutions collaborating with AHRI	56	56	56
2.3	Number of graduates	9	10	11

Summary assessment by outcome 2, performance indicators:

Number of trainees (long-term and short-term): This is the total number of researchers enrolled in long-term trainings of MSc and PhD along with trainees of short-term trainings conducted during the reporting period.

Number of institutions collaborating with AHRI: This indicator refers to the total number of institutions which collaborate with AHRI through MOUs, Grant and Subgrant agreements, during the reporting period.

Number of graduates: The number of graduates for the year. Its noteworthy that the five graduates scored "Excellent" in thesis defense.

Outcome 3: improved public engagement in planning, implementation and M&E

AHRI, guided by its Community Engagement Guideline, engages communities in the researches it conducts. All research projects that require engagements of different community members strictly adhered to meet the 100% institutional commitment standard.

.AHRI provided diagnostic laboratory services that are not easily available to 5,181 patients. The tests were 909 TB, 3,358 FNA, 1,450 pathology, and 123 immune response tests of pregnant mothers. AHRI carried out various community support initiative to needy and vulnerable children, leprosy survivors' associations and clubs to fulfill its corporate organizational social responsibility.

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
3.1	Proportion of projects that engage the community	100%	100%	100%
3.2	Number of community activities supported	4	4	4
3.3	Number of patients receiving diagnostic services	4,500	5,180	5,180

Summary assessment by outcome 3, performance indicators:

Proportion of projects that engage the community: It refers to research projects that involve the community in problem identification, planning, execution and evaluation.

Number of community activities supported: The indicator refers to financial and material support provisions to leprosy survivors' association and children who need support for their education.

Number of patients receiving diagnostic services: It refers to diagnostic services given to patients who are referred to AHRI from hospitals

Outcome 4: improved effectiveness and efficiency in fund management

AHRI purchased and deployed an Enterprise Resource Planning (ERP) software from Oracle and all its grant financial data and process has been made cloud-based. In addition an Electronic Government Procurement (eGP) was implemented to manage procurements of the institute integrated with other federal level procurements. Furthermore, an initiative of the FDRE Ministry of Finance, Integrated Financial Management Information System (IFMIS), has been deployed to manage financial transactions and date of funds from government treasury. Staff who are directly involved in IFMIS, ERP and EGP has been trained and they are all using the three systems.

AHRI planned to utilize 570 million ETB from all sources during the reporting period. The regular budget allocated from the federal treasury was 290,139,600 ETB and 175,843,334 ETB (60.6%) was utilized. There was 328,950,428 ETB allocated from Norad (54,443,704 ETB) and other competitive grants. A total of 311,876,769 ETB (95%) utilized during the fiscal year. The overall expenditure rate from all sources was 79%.

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
4.1	Timely financial reporting	85	85	100%
4.2	Number of international competitive projects AHRI as PI	N/A	N/A	N/A
	Fund secured/ Mobilized resource	760,679,020	570,000,000	2,224,578,810
	Proportion of timely accomplishment project milestones	80	79%	100%
4.3	Fund utilization (Burn rate)	86	79%	93%
4.4	Local procurement lead time (days)	60	60	60
	Foreign procurement lead time (days)	220	200	200

Summary assessment by outcome 4, performance indicators:

Timely financial reporting: It refers to financial report submissions based on the project agreement/ standard time frame

Number of international competitive projects AHRI as PI: It refers to the total number of international competitive projects AHRI as PI in specific fiscal year (new projects every year) The indicator is measured every three years.

Fund secured/ Mobilized resource: It is the total amount of research fund secured/ Mobilized resource except government allocation in specific fiscal year

Proportion of timely accomplishment project milestones: It refers to timely accomplished project milestones in specific period of time

Fund Utilization (Burn Rate): It refers to the overall utilization of funds from all sources planned to be spent during the fiscal year.

Local procurement lead time (days): It refers to the average number of days elapsed for all local procurements from purchase request up to receiving of goods and services.

Foreign procurement lead time (days): It refers to the average number of days elapsed for all international procurements from purchase request up to receiving of goods and services.

Outcome 5: new knowledge generated and new/improved tools developed

Research is the mainstay of AHRI in the reporting period. AHRI researchers were able to successfully acquire a number of competitive grants from both local and international sources. As a result, compared to the previous year (N=74) there are now a total of 82 ongoing research projects, increasing by 11 %.

A total of 17 new collaborative agreements were signed with local and international partners which was higher than last year (n=12). These include the SOLIDARITY Plus trial for the treatment of COVID-19 Patients (funded by WHO); Molecular dissection of leprosy immunopathology to inform the use of novel therapeutics (funded by Dioraphte); APOPPO II; Enhancing TB Detection using Hero Rats (funded by the Government of France); A holistic approach in patient management and epidemic surveillance through convergence of diagnostic technologies, capacity building and stakeholder engagement (HoliCare) (funded by the EU); Developing strategies for hepatitis C in Ethiopia (DESTINE) (funded by NIHR); HPV Microbiota (funded by Lund University); Improving maternal health outcomes in Ethiopia by integrating of point-of-care testing for sexually transmitted infections in antenatal care (IMPRESS) (funded by VLIR-UOS); OptiVivax- Optimizing a High Efficacy Plasmodium vivax Malaria Vaccine (funded by the EU); Drivax: What drives Plasmodium vivax transmission in incident or relapsing infections (DRIVAX)(funded by the Wellcome Trust) and Brucellosis project funded by Geigy Foundation.

Non communicable diseases research projects in the area of breast cancer, cervical cancer, lymphoblastic leukemia, myeloid leukemia, and podoconiosis are progressing very well. Two research outputs are under peer review while 6 manuscripts are under preparation. Through the CEBHA+ project four manuscripts have been published on Cardiovascular disease risk prevention tools that could be implemented by health extension workers. Very good progress has also been made in the study of the impact of COVID-19 on patients with diabetes, and the development of mobile app that could be used to self-monitor diabetes.

Strides were made in AHRI' signature project, the TBGEN in which partners from Cameroon, Sudan, Eritrea and the UK are involved. Whole genome sequencing was performed on a total of 210 TB isolates and 89 human DNA. Additional sequencing has also been performed on 160 Tb isolates collected from Bale Zone and Saudi returnees.

As a testament to the increasing capacity in genomics and bioinformatics at AHRI, sequencing was performed on 784 malaria parasites, and 285 bacterial isolates. In addition, with the help of the SUPER project (funded by BMGF) and through the support of Africa CDC, additional 1525 SARS-CoV-2 samples were sequenced.

The study on the use of bubble continuous positive airway pressure (BCPAP) for treatment of children aged 1-59 months with severe pneumonia and hypoxemia in Ethiopia was successfully completed and the results were disseminated to national stakeholders including MOH.

Through the Grand Challenges Ethiopia Scheme that aims to promote local health innovations, support was provided to 10 Transition to scale projects. In addition, in the budget year, a guideline for National Health Innovation Steering committee which will be involved in solving problems faced by innovators and facilitates the production and use of the innovations was prepared, and National Health Innovation Steering Committee was formed.

A total of 82 peer reviewed manuscripts and one book chapter were published during the current fiscal year and the mean impact factor was 5.7 (ranging from 0.1 to 87.2), based on Thomson Reuters Scale.

Output	Indicator	2022/2023		2023/24
		Planned	Achieved	Planned
5.1	Number of publications	65	83	70
5.2	Number of new/improved tools developed	2	N/A	N/A
5.3	Number of innovations supported	29	29	N/A

Summary assessment by outcome 5, performance indicators:

Number of publications: Number of peer reviewed scientific publications that are produced by AHRI researchers, other AHRI affiliated researchers and students

Number of new/improved tools developed: It refers to the number of new/improved methods and tools (devices, diagnostics, therapeutics, vaccine,) developed The indicator is measured every other year.

Number of innovations supported: There have been 29 innovations supported through Grand Challenges Ethiopia hosted by AHRI during the reporting period.

Outcome 6: improved medical research capacity

Training graduate students (MSc, PhD) is one of the key missions of AHRI: In this reporting period, 10 of our graduate students successfully defended their thesis of which 4 were PhD students and 6 were MSc students. AHRI also accepted 10 new students, bringing the total number of PhD and Masters

students to 84. There are 58 PhD students, 14 female and 42 male, and 26 MSc students, 18 male and 8 female.

Upgrading employee knowledge and skill: in this reporting period, the technology that provided opportunities for employees to upgrade themselves through different levels of training has been giving for further information, see annex 1.5

Staff and student training abroad: The Quality of research depends on well-trained researchers. Skills that can improve work performance are usually gained through taking refresher training, updating oneself on the scientific world, which changes every day, and spending some time in another advanced lab to learn new skills and techniques. In this regard, AHRI staffs/students are encouraged and supported to take additional training that benefits their work and enhances their skills. In this reporting period, 3 PhD students (2 females) traveled to Sweden. and 1 (male) student trained abroad for LAMP for Dengue virus, SARS-CoV-2, Chikungunya virus

Supplementary short courses: Twelve trainings were conducted in this reporting period through RTD. These included: Hands-on Grant Writing Course DGD Framework Agreement 5 Ethiopia and Alliance, Mentorship and Women in Carrier Path, Grant Writing and Development, Advanced Red Cap, Design, Advanced Molecular Techniques and Others. (The complete list of the trainings conducted is attached as Annex 2.). A total of 218 participants, including AHRI students, researchers, and staff, as well as those from partner institutions, attended trainings on 12 topics. It included 108 AHRI staff (68 female), 40 AHRI students (17 female), and 29 (11 female) from other partners. The short term courses are not limited to Ethiopian students. There were 7 students from various African countries (Camerroon 2, Eriterea 3, and Sudan 2) who attended week long Bionformatics training on *M.tb* at AHRI.

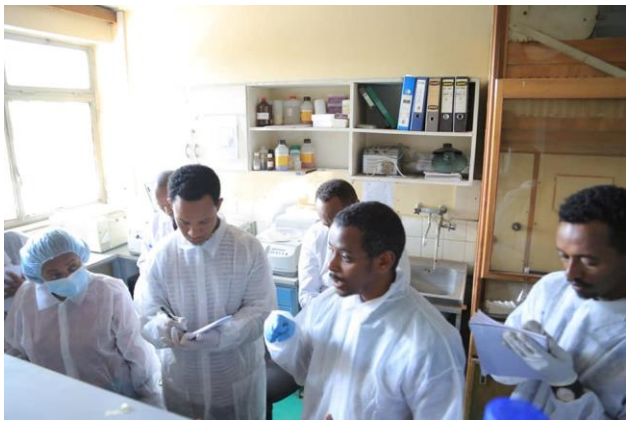

Figure 6: Partial attendants of the Training on Advanced Molecular Techniques

Laboratory meetings: This scientific lab meeting has always been regular, with the exception of when the COV -19 outbreak occurs, and it is an essential aspect of AHRI where the staff and other guests keep up to date with scientific and research advancements. Unless some scheduling conflicts arise, it has been routine; there have been 34 face-to-face laboratory meetings during this reporting period.

Accrediting training courses: As part of the effort towards accrediting training courses, AHRI organized consultative workshops with various stakeholders and on this reporting period, it has started laboratory safety and bio management as one of the accrediting courses in addition to the ones that already existed like Advanced Molecular Biology Techniques, GCP and GCLP courses.

Alumni association: There has been a graduate tracer study conducted that covers graduates in the last ten years to establish an alumni association. This graduate tracer program study assessment is designed to be conducted every two years, so in this reporting year, an Almuni committee has been formed that includes AHRI senior staff and Alumni community members. The study conducted in the preceding year focused on identifying how many of the last five-year graduates were engaged in research areas. As mentioned, the study is to be conducted every two years; hence, there is no update in the last year's data regarding the study. The report from last year also emphasized the necessity of conducting larger studies and forming alumni associations that would act as crucial points of contact to enhance the network**.**

Postgraduate training programs and collaborative research projects: AHRI has been effective in conducting postgraduate training programs and collaborative research projects with various local and international partner institutions all over the world. To mention a few: Emory University, Lund, Uppsala, and Orebro universities; Karolinska Research Institute, Radboud University, Collaboration for Evidence-Based Healthcare and Public Health in Africa, London School of Hygiene and Tropical Medicine, Leiden University, University of Oslo, John Hopkins School of Public Health, International Center for Diarrheal Diseases Research, Bangladesh; and several other institutes in Europe and North America. Furthermore, AHRI maintains successful collaboration and relationships with MoH and local institutions and universities: University of Gondar, Jimma, Hawassa, Haramaya, Addis Abba University, Tikur Anbessa Specialized Hospital, Mekelle, Arba Minch, Arsi, Debre Berhan, Debre Markos Universities, Ambo University, and St. Paul's Millennium Medical College, which joined the clinical research network. The postgraduate training program is not limited to Ethiopian students. For instance, a student from Somali Land is conducting a MSc research at AHRI.

In addition to that, the AHRI/ALERT Ethics Review Committee (AAERC) received a recognition certificate from the Strategic Initiative for Developing Ethics Review Capacity (SIDCER) Program Survey in the past year It also got national recognition level A from IRERC This was a major milestone for the committee, and The Research Ethics Committee has launched an internet based platform that will increase the feasibility and accessibility of e-Learning. The training platform was launched on March 20, 2023, and to date, more than 200 trainees have registered and attended the training.

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
6.1	Number of short-term trainees	310	210	315
6.2	Number of course modules developed	4	2	2
6.3	Number of joint programs	4	4	4
6.4	Number of long-term trainees	100	84	86

	Proportion of timely postgraduate completion	7	10	10
6.5	Proportion of long-term female trainees	50%	28%	40%

Summary assessment by outcome 6, performance indicators:

Number of long-term and short-term trainees: Short-term training refers to a few days or months of training to develop the ability and capacity of the trainees involved, whereas long-term training refers to trainees enrolled in colleges and universities for career growth.

Number of course modules developed; AHRI's other mandate, in addition to conducting research, is to deliver research trainings and create training modules to enhance and standardize the quality of trainings. The reporting period saw the development as well as assessment of three modules.

Number of joint programs: AHRI has numerous joint programs, and this includes the University of Gondar, Haramaya University, Jimma University, Addis Ababa University, and a new addition, Ambo University. The joint AHRI-AMBO University Joint PhD Program Evaluation Meeting was conducted during the reporting period for further strengthening. There are ongoing efforts to expand the joint program to other universities as well.

Number of Long-Term Trainees: Included in this are MSc and PhD students who have registered to conduct their research at AHRI.

Proportion of timely postgraduate completion:. The figure reflects how many graduates completed their research at AHRI and successfully defended their theses**.**

Proportion of Long-term female trainees: In order to reduce gender discrepancies in the field, AHRI encourages female researchers, which is the reason why the plan and aim are consistently reviewed.

Outcome 7: improved quality assurance system

AHRI strives to implement quality improvement activities to ensure all the services and products meet local and global standards. To this end, major services and products are identified each year to receive international and local accreditations and recognitions.
Some of the areas for quality assurance include: Good Clinical Practice-GCP/Good Clinical Laboratory Practice-GCLP, diagnostic laboratory test accreditation, biosafety and GCLP certifications, data management, research ethics and scientific review system, publications on high impact factor journals, revise and implement training policy/guidelines, course accreditations, course evaluations, monitoring and evaluations are also designed to ensure quality of researches and services.

AHRI maintained accreditation of two laboratory tests for TB diagnosis, TB microscopy and TB culture. Preparatory work including document preparation completed to accredit chemistry test at the clinical trial laboratory. In addition, two additional courses were accredited this year by the local accreditors and the total accredited course are four including: Good Clinical Practice (GCP), Biosafety and Biosecurity, Research Ethics and advanced molecular techniques. Other course modules like clinical trial monitoring courses are under review by an evaluating agency.

In the year, a guideline was developed on Good Clinical Laboratory Practice (GCLP) to be endorsed by the management which will be used to facilitate the research lab accreditation process. The effort to improve the quality of articles produced by the institute by publishing in high impact journals has achieved more than the target for this year.

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
7.1	Number of quality assurance systems	6	6	6
	Proportion of accredited diagnostic tests	62%	66%	75%
	Proportion graduates with 'excellent' score	100%	90%	100%
	Impact factor of publications	4.5	7.04	7.04
7.2	Proportion of GCLP certified laboratories	N/A	N/A	N/A
	Number of biosafety certified laboratories	N/A	N/A	1
7.3	Proportion of courses accredited	42%	50%	70%

Summary assessment by outcome 7, performance indicators:

Number of quality assurance systems: The six quality assurance mechanisms AHRI strives to implement are: GCP/GCLP, biosafety and biosecurity, research ethics, course accreditation, diagnostic test accreditation and high impact factor publications.

Proportion of accredited diagnostic tests: AHRI has three diagnostic tests that need accreditation and 2 (66%) of them obtained accreditations.

Proportion graduates with 'excellent' score: 9 of the 10 graduates from AHRI during the reporting period scored "Excellent" in defending their dissertations.

Impact factor of publications: The average impact factors of AHRI's publications during the reporting period reached 7.04.

Proportion of GCLP certified research laboratories: The indicator is to be measured every five years.

Proportion of courses accredited: four out of eight course modules (50%) have been accredited.

Outcome 8: improved performance of program/project management

The Council of Ministers of EFDRE has expanded the mandate of AHRI under Regulation Number 530/2023. Accordingly, Traditional and Modern Medicine Research, Vaccine and Diagnostic Medical Tools Research & Development and Pharmaceutical Industry Development are the new areas brought to AHRI from other sectors. This in turn has brought the need to revise and align the existing Ten-Years Strategic Plan of the Institute.

There were 258 major activities planned during the reporting period; out of which 203 were achieved in green category (80% and above), 14 yellow (below 80% and above 55%) and 41 red (55 and below). The overall annual physical performance of the institute was 88.6%.

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
8.1	Proportion of timely accomplished project milestones	86	79%	90%
	Projects evaluated as per project agreement	N/A	N/A	N/A
8.2	Frequency of M&E	4	4	4

Summary assessment by outcome 8, performance indicators:

Proportion of timely accomplished project milestones: It refers to the number of attained milestones during the reporting period against the total targets of the year.

Projects evaluated as per project agreement: Refers to the number of projects evaluated during the reporting period as per agreements with funders.

Frequency of M&E: This refers to the quarterly general performance monitoring mechanism. Each project has its own built-in M&E plans and activities which are not counted here.

Outcome 9: improved networking, information resource access and institutional visibility

AHRI endeavored to establish and strengthen local and international partnerships and fora and plays an active role. The Director General of the Institute, Prof. Afework Kassu is member of the investors' council of CEPI and Dr. Alemseged Abdissa, the Deputy Director for Medical Research, is member of the General Assembly of the EDCTP.

AHRI organized consultative meetings with its local and international stakeholders during the year. The meetings were organized in Addis Ababa six regional capitals: Addis Ababa, Adama, Jigjga, Dire

Dawa, Semera, Hawassa and Bahir Dar. Honorable members of the EFDRE parliament, Officials from Office of the Prime Minster, Ministry of Health were in attendance in the meeting conducted in Adama. The agenda of the meeting focused on how to utilize knowledge generated in research in decision making and the participants provided feedback and directions on ways forward. Participants of the other meetings included university and other institution based researchers, academicians, professional association leaders and representatives of pharmaceutical industry owners.

Figure 7: Pharmaceutical Manufacturing Industry Stakeholders' Meeting at Hilton, Addis Ababa

The institute utilized mainstream electronic media, social media and print media to disseminate its undertakings to the public. There was a weekly radio broadcast televised nationwide and senior researchers and other experts of the institute explained to the general public regarding progresses made in AHRI.

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
9.1	Number of institutions collaborating with AHRI	56	56	56
	Number of networked institutions	13	13	13
9.2	Number of project agreement/MOUs signed collaborators	56	56	56
9.3	Number of hits/number of viewers to AHRI website	900,000	820,290	900,000
9.4	Number of information dissemination media	3	3	3

Summary assessment by outcome 8, performance indicators:

Number of institutions collaborating with AHRI: it refers to institutions actively collaborating (local and international) with AHRI in conducting research, training and resource mobilization

Number of networked institutions: This refers to institutes like universities, hospitals and professional associations whereby AHRI established networks to facilitate is research and research training engagements.

Number of project agreement/MOUs signed collaborators: It refers to project agreements or Memoranda of understanding signed between AHRI and other institutes. .

Number of hits/number of viewers: This refers to the number of viewers of AHRI's website in the reporting period.

Number of information dissemination media: It refers to the type of information dissemination media AHRI used printed media, audio visual mainstream and social media to reach out its audiences during the reporting period.

Outcome 10: improved performance of human resource management and governance system

AHRI re-established in 2022/2023 with additional responsibilities due to the merging of Traditional Medicine Research, Vaccine and Diagnosis Departments from Ethiopian Public Health Institute (EPHI) and Pharmaceutical Industry Development wing from the Ministry of Industry of Ethiopia. To accommodate the additional responsibilities, a new organizational structure was developed, approved and implemented. Based on this structure, restructuring of existing staff and transferring from other institutions was made to fill vacant places and the number of total staff, at the end of the reporting period, reached to 587 of which 274 (47%) are women. Familiarization workshops were conducted to bring the staff on board to the new mandate of AHRI.

This outcome is about availing, developing, organizing and managing organizational human resources and ensuring good governance to achieve institutional objectives. It includes recruiting, capacity building and maintaining proper professional mix with special emphasis for women to create gender balance. In addition, it deals with creating appropriate organizational structure, human resource management and implementing guidelines that will help to enforce transparency and accountability. Below is a summary table of planned targets and achievements during the reporting period.

Output	Indicator	2022/2023		2023/2024
		Planned	Achieved	Planned
10.1	Number of research workforce	300	280	NA
	Proportion of women Senior Researchers	50%	53%	50%
	Proportion of women in leadership position	50%	28%	50%
10.2	Proportion of women among research staff	NA	41%	NA
10.3	Number of staff on long term trainings (Diploma, BSc, MSc, PhD)	36	67	41
10.4	Number of staff on short term trainings	NA	663	764
10.5	Staff attrition rate	2.5%	1.6%	2%
	Staff satisfaction rate	98%	86%	87%

Summary assessment by outcome 10, performance indicators:

Number of research work force: This target measures the proportion of research staff against administration staff and it is used to monitor the trend of staff joining the research wing.

Proportion of women senior researchers: The target is tracked to monitor the trend so as to achieve continuous increment of senior women researchers.

Proportion of women in leadership positions: The target is tracked to monitor the trend so as to achieve the aspiration to increase the number of women who lead research projects at AHIRI.

Proportion of women among research staff: It is tracked to manage the improvement towards reducing the gender disparity among employees of the institute.

Number of staff on long term training (Diploma, BSc, MSc and PhD): AHRI encourages and supports its employees to advance in their career. There have been 67 staff enrolled in colleges and universities in various fields from diploma to PhD levels.

Number of staff on short term training: The training is intended to improve capacity and skill of employees in their respective disciplines. There have been 723 staff trained out of which 384 were female.

Staff Attrition Rate: AHRI tries its best to retain its well trained and experienced staff and tracks the trend annually. The attrition rate reached 3% which needs further effort to meet the planned target as well as retain skilled and experienced staff in the institute.

Staff satisfaction rate: this indicator measures the level of employees' satisfaction on the institute's governance, internal services and allocation of different opportunities. This is also one means of retaining staff and reducing the attrition rate.

Outcome 11: improved capacity and effectiveness of institutional infrastructure

The new building that has been under construction is currently near completion with ninety nine percent of its expected performance completed. The new branch at Adama city has started its research activities partially despite few challenges faced. One major challenge was the need for infrastructural redesigning and repurposing of the building complex to suit needs of a laboratory-based research facility, and redesigning of the building is currently finalized.

The Institution has continued the effort to acquire new laboratory equipment and keep maintenance on the utilized facilities. Proper calibration and maintenance protocols have been implemented by the appropriate agencies and laboratory equipment repair was conducted as needed.

To increase work efficiency there was an effort to automate systems in the areas of financial transactions, procurement and laboratory management information system (LMIS). Currently staff

training has been completed and three of such systems are implemented and running which are The Integrated Financial Management Information System (IFMIS), Enterprise resource planning (ERP) and Electronic Government Procurement (e-GP). These software systems have been outsourced and purchased with a major contribution from the government and funding from our partners, the Swedish international development cooperation agency (Sida) and Norwegian agency for development corporation (Norad).

IFMIS is a tool to automate financial operations and currently used to facilitate transactions related to financial transactions for government funded projects. The other is ERP software which is integrated management system software currently implemented for use in our institution for projects that are foreign funded. e-GP is another software that has been deemed useful to accelerate the process of procurement and is currently implemented in our system. These systems are currently fully functional and in use. The effort for establishing LMIS was faced with budget constraints and has not fully been implemented. Furthermore, additional internal network capacity has been developed in terms of linking software networks to enable planning, file sharing and help desk assistance.

An online based research ethics training course has been launched and is giving training courses to students, staff of the institutions and collaborators. Also Research ethical approval submission system has been developed for a proficient ethical approval and engagement process. This system software has been developed and is on the track to full implementation.

Output	Indicator	2022/23		2023/24
		Planned	Achieved	Planned
11.1	% Construction completed of the new lab complex	100%	99%	100%
11.2	Number of new research branches	1	1	1
11.3	Proportion of functional equipment	85%	94%	95%
11.4	Number of state-of-the art equipment	5	4	5
11.5	Proportion of automated system	50%	50%	50%
11.6	Customer satisfaction rate	90%	85%	90%

Summary assessment by outcome 11, performance indicators:

% Construction completed of the new lab complex: This refers to the percentage of completion of the new AHRI research laboratory building complex which is funded by the Federal Government of Ethiopia

Number of new research branches: This implies to the new research branches that are planned to be located outside of Addis Ababa.

Proportion of functional equipment: This are the research laboratory equipment that are in the AHRI laboratory and perform the day to day research activities

Number of state-of-the art equipment: This are current and up to date research laboratories equipments that assist in the advancement of new research endeavors

Proportion of automated system: This implies to the effort to convert the manual and tedious routine operations with software based systems

Customer Satisfaction Rate: Customer satisfaction rate refers to the fulfillment of our customers according to their expected delivery of service

Major challenges and coping mechanisms deployed

There was a delay in approval of AHRI's revised establishment regulation which was finalized in the third quarter of the budget year. After the Council of Ministers approved the regulation, though, additional restructuring was done.

The security problem that affected some areas of the country did pose a challenge for research projects which were planning to recruit or recruit study participants in these areas. The peaceful resolution of the security problem allowed the resumption of some of the research projects while others managed to change their study sites.

Customs clearance has been a long-standing challenge for AHRI on procurements and of reagents and consumables and donations from partners. The senior management of the institute has held fruitful discussions with the leadership of Ethiopian Food and Drug Authority (EFDA).

- **Annexes**

1. Current status of AHRI human resource by category and level of education

1.1. Current Human Resource

Employees by Category	Gender			Level of Education								
	M	F	T	PhD	MSc/ MA	DVM plus MSc	MD plus MSC	DVM	MD	BSc/ BA	Dip. & Below	Total
Technical Government	97	64	**161**	9	53	3	65	1	9	58	22	**220**
Technical Contract	96	60	**156**	14	36	-	39	-	9	75	6	**179**
Administrative Government	97	136	**233**	6	12	5	5	-	-	44	13	**85**
Administrative Contract	20	11	**31**	-	4	-	-	-	-	12	6	**22**
Total	**310**	**271**	**581**	**29**	**105**	**8**	**109**	**1**	**18**	**189**	**47**	**506**

2. List of short-term research trainings conducted at AHRI [July 2022 - June 2023]

Training Date	Training Title	Participants											
		AHRI Staff			AHRI Students			Outside AHRI			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Oct 17-22, 2022	Instructional Design	4	11	15			0			0	4	11	15
3-Oct-22	Research Ethics training	8	9	17	7		7		1	1	15	10	25
Dec 5-9 , 2023	Grant writing and development	9	18	27		1	1			0	9	19	28
Dec 5-14, 2022	Laboratory Training			0			0	1	2	3	1	2	3

Feb 20-25, 2023	Advanced Data Analysis using R-Studio Software							10	1	11	10	1	11
Mar 6-11, 2023	Hands-on Grant Writing Course		2				0	5	2	7	5	4	9
Apr 3-8, 2023	Advanced Molecular Biology Techniques	2	2	4	11	2	13	2	2	4	15	6	21
May 15-19, 2023	Good Clinical Practice		2	2	5	14	19		3	3	5	19	24
May 24-29, 2023	Advanced Red cap	10	12	22			0			0	10	12	22
June 12-16, 2023	Training Facilitation Skill	7	12	19			0			0	7	12	19
Oct 17-22, 2022	Instructional Design	4	11				0			0	4	11	15
3-Oct-22	Research Ethics Training	8	9		7		7		1	1	15	10	25
Dec 5-9 , 2023	Grant Writing and Development	9	18			1	1			0	9	19	28
Dec 5-14, 2022	Laboratory Training						0	1	2	3	1	2	3
Feb 20-25, 2023	Advanced Data Analysis using R-Studio Software						0	10	1	11	10	1	11
Mar 6-11, 2023	Hands-on Grant Writing Course		2				0	5	2	7	5	4	9
Apr 3 -8-, 2023	Advanced Molecular Biology Techniques training	2	2		11	2	13	2	2	4	15	6	21
May 15-19, 2023	Good Clinical Practice		2		5	14	19		3	3	5	19	24
May 24-29, 2023	Advanced Red cap	10	12				0			0	10	12	22
June 12-16, 2023	Training Facilitation Skill	7	12				0			0	7	12	19
Total Trainees		80	136	106	46	34	80	36	22	58	162	192	354

3. Lab meeting and seminar sessions conducted

NO	Name of the Presenter	Title Of Lab Meeting Presentations	Date of the Session
1	Oumer Ali	Impact of a holistic integrated care package on clinical and psychosocial outcomes for people with lower limb disorders due to Podoconiosis, Lymphatic Filariasis and Leprosy	Aug1, 2022
2	Wondmagegn Demsis	Molecular genetics, treatment outcome, vaccine efficacy and mother to child transmission of HBV in tertiary hospitals of Central & North-East Ethiopia.	August 8, 2022
3	Dr. Zewdu Terefe	"Current status of genetic testing in Ethiopia, challenges and opportunities".	August 15, 2022
4	Solomon Ali,	Community Wastewater-Based Surveillance Can Be a Cost-Effective Approach to Track COVID-19 Outbreak in Low-Resource Settings: Feasibility Assessment for Ethiopia Context	August 22, 2022
5	Liya Wassie	- "Immune Signatures to Characterize Progression from latent TB infection tom,active TB disease (TBRU)	August 29, 2022,
6	Kidist Bobosh	Insight on Leprosy Disease	Sept 5, 2022,
7	Winner Kucha	Polymorphisms in selected folate pathway genes as maternal risk factors for neural tube defects"	Sept19, 2022
8	Dr Abel Girma	The Effect of Anti-coagulation Dosage on the Outcome of Hospitalized COVID-19 Patients in Ethiopia: A Multicenter Retrospective Cohort Study"	Sept 7, 2022
9	Wakweya Chali	Longitudinal assessment of clinical P. vivax infections and kinetics of transmissibility to mosquitoes in clinical Plasmodium vivax in Arba Minch, Ethiopia"	October 29, 2022
10	Eleni Seyoum	Antiretroviral Treatment Outcome in HIV Positives Co-infected with Viral Hepatitis and Tuberculosis in Addis Ababa, Ethiopia	October 10, 2022
11	Liya Wassie	Principles of Research Ethics on Researches Conducted on Human Subjects	October 17. 2022
12	Chala Chaburte	Determination of Functional Impacts of Differentially Expressed PhoP Gene on Mycobacterial Virulence in Causing Tuberculous Meningitis"	October 24, 2022
13	Alemseged Abdi	Open Science The Nuts and Bolts	November 7,2022
14	Alemayehu Letebo	Spatial distribution of antimalarial drug-resistant gene mutations and genetic diversity of plasmodium falciparum parasites Ethiopia ."(.dissertation proposal)	Nov14,2022
15	Tamás Laskay	Topic- "Neutrophil and Leishmania infection"	Nov 21, 2022,
16	Dr. Adane Miheret	Half a Century Research Journey and Contributions of Armauer Hansen Research Institute	November 28, 2022
17	Bethlehem Adinew.	Bioinformatics: the next generation tool for boosting basic	Dec 5, 2022

18	Migbaru Keffale	Ethiopia in-vivo Efficacy Study2021: Therapeutic efficacy of Artemether-Lumefantrine or Artesunate-Pyronaridine plus Single Dose Primaquine for the treatment of uncomplicated Plasmodium falciparum	Dec 19, 2023
19	Melesse Hailu	Molecular epidemiology of carbapenem and colistin resistance and extended spectrum beta-lactamase producing Enterobacteriaceae among sepsis patients in Ethiopia".	Dec 30, 2023
20	Alemseged Abdissa	Institutionalization of Research Mentorship	January 13, 2023
21	Alem Alemayehu	Title: - "Genetic diversity and Drug resistance pattern of MTBC among Smear negative PTB patients ".	Febr 3,2023
22	Dr Fitum Girma	The role of An. stephensi for urban malaria transmission in Ethiopia".	Feb 17, 2023
23	Massame Tadesse	Exploring Practice of Traditional Medicine Use and Sources for Cutaneous Leishmaniasis among the Communities of Kallu District, South	Feb 24, 2-23
24	Wagari Tafese	Facilitators and Barriers in Health Care Seeking For Common Skin Neglected Tropical Diseases in Kallu District,	March 3, 2023
25	John Clemens,	Inactivated oral cholera vaccines: from biomedical concept to public health reality'	March 24, 2023
26	Nardos Abebe	"GENOMICS OF SELECTED NON-COMMUNICABLE DISEASES: results from SNP based genetic risk estimate on Hungarian general and Roma populations for type 2 diabetes	March 24, 2023
27	Dr. Sintayehu M	Metabolic engineering of Escherichia coli to facilitate recombinant production of eukaryotic phytochromes for macromolecular crystallograph	April 06, 2023
28	Prof. Simon Rayner	INVESTIGATING SCIENTIFIC RESEARCH IN INFECTIOUS DISEASE AT A GLOBAL SCALE	APRIL 7 , 2023
29	Dr. Ruchir Pansuriya,	Introduction to technology transfer with special emphasis to oral cholera vaccine (OCV)	May 12, 2023
30	Dr. Ana,	Lancet editorial process	May 31, 2023.
31	Nebiyou T	DRINKING WATER CHLORINATION BYPRODUCTS AND CANCER RISKS IN ADDIS ABABA, ETHIOPIA	June 2, 2023
32	Mikias Negash	Host immune response and their role in the pathogenesis of Podoconiosis	June 8, 2023
33	Rachel Park, EuBiologics	Development, production and innovations of oral cholera vaccine	16 June 2023
34	Dawit Woliday	On Immunogenic Risks Associated with Covid-19 Clinical	June 23, 2023

4. List of local and international conferences and meetings attended by ahri staff and students

Name of attendee	Conference/ Meeting Name	Venue/ Place	Dates	Brief note on purpose and accomplishments of the conference
Dr Alemseged Abdissa, Dr Mekonnen Teferi and Mr Anteneh Habte	East African Personalized Medicine Stakeholders Workshop	Nairobi, Kenya	July 13-15 2022	This workshop was organized to assess challenges and opportunities on personalized medicine in East Africa and to strengthen collaboration with European partners.
Prof.Afowerk, Dr Alemseged, Dr Markose,Dr Adane, Dr Liya, Dr Rawli W/ro Yamerot	Exchange visit to collaborating Institutes	Norway, Sweden, Denmark	May 22-June 3, 2022	Identifying core areas of research collaboration and sustaining funding support from Norad and Sida. The team has also assured that the funding in the following budget years shall be used to address the needs of AHRI's strategic plan within Sida/ Norad framework and in improving and leveraging already existing networks with the Scandinavian institutions and partners.
Dr. Yohannes & Abay	ICFM co-creation intervention workshop	Ghana	September 22-31, 2022	Experience sharing for ICFM co-creation intervention workshop at district level
Dr. Fitsum		The Netherlands	09 February – 01 March 2022	Grant writing and discussion on new projects.
Dr yehenew, Temsgen, Getnet & Dr Endalamaw		Djibouti	Sep 19-24, 2021	project wide meeting
Dr Fitsum		Cote D'Ivoire	July 3-9, 2022	2nd WAASuN meeting in Abidjan for experience sharing and networking
Dr Fitsum		Cameroon	16 – 26 June 2022	Support the National Malaria Control Program
Dr. Kidist Bobosha, Melese Yeshambaw & Tamirat Assefa	Annual conference of SeroSelectTB project	Capetown, South Africa	22-26 Aug 2022	SeroSelectTB project follow up

Tewodros Tariku., Mekdes Alemu & Metasebia Wakjira	TBGEN project monitoring activity	Khartoum, Sudan	9-14 Oct 2022	Sudan is one of the TBGEN partners. The team from Ethiopia has conducted an assessment on the project activiites
Dr. Alemseged Abdissa	Grand Challenges Learning and Evaluation meeting	The Gates Foundation and Emory University (USA)	April 18-30, 2023	Identifying and align as a group on specific tangible outcomes and how we could work back from new planned activities at the 2023 GC Annual Meeting in Senega . how to improve the innovation pathway landscape in Africa
Dr. Adane Mihret, Getachew Tesfate, Dr. Andargachew Mulu	Holicare Kickoff Meeting	Lund University, Sweden	October 2022	To participate in Holicare Kickoff meeting and renetworking with partnering Institutions, sharing and integration of objectives of WPs between partners
Dr. Rawleigh Howe	Confrence on the Science of dissemination and implementation in Health	Washington DC, US	December 11-14, 2022	To present a research paper on HEWs leaded community based CVD risk screening
Dr. Andargachew Mulu	Keystone Meeting on Human and Microbes Coevolution	Hanover, Germany	May 29-June1,2023	To participate on the Keystone Regular workshop on coevolution of Human and Microbes
Dr. Andargachew Mulu	Microbiome Study	Denmark, Copenhagen	August 15-27,2022	To participate on Microbiome study
Dr. Rawleigh Howe	RHISSA conference	Capetown, South Africa	March 27-30, 2023	Close out meeting for BMBF funded projects and launching of the new BMBF funded Grants
Dr. Abel Abera	16th European Meeting on the Molecular Biology of the Pneumococcus	Crete, Greece	May 23-23, 2023	To present a conference on Genomic characterization of S. pneumoniae
Melat Dereje				

Firaol Mesfin		Stellenbosch University, South Africa	July 14-15, 2023	To attend a workshop on Issue brief development
Dr Yohanies H/Michael	15th International Health Economics conference,	Cape Town, South Africa,	July 8-12,2023	Participate on the conference & present the content "Understanding the Economic Burden on Households of Neglected Tropical Diseases of the Skin:
Dr Endalamaw Gadisa	ITM Annual colloquiun and joint partner meeting	Belguim	6th-9th, decemner 2022	Paticipate on ITM Annual colloquiun and joint partner meeting
Dr Endalamaw Gadisa	BL Elimination strategic document review in East Africa	Nirobi, Kenya	24th-27th, Jan 2023	Paticipate & review BL Elimination strategic document in East Africa
Girma Shumie	DPP Consortium Meeting	Bordeaux, France	24-26, Jan 2023	Progress report on the DPP project;Assessing pediatric premaquine in Ethiopia
Dr.Adamu Bayissa and Dr.Mekonnen Teferi	STREAM stage 2 final investigator meeting	Jaipur, India	March 6-9,2023	As a STREAM2 trial site,national update on DRTB treament was presented. Discussions on STREAM2 trial outcomes.
Mikias Negsh and Dr. Menberwerk Chanealew	podoconosis project	UK	December 13-14,2022	Poster presentation and participation
all members local and international cebha+ project plus invited partner guests	annual meeting of CEBA+ consortium	Ethiopia, AA	September 6-9,2022	dissemination workshops on the finalization of the project
all cebha+ project members	systematic review result dissemination	Ethiopia, AA	March 14-16,2023	result dissemination on the pro longed systematic review

All cebha+ project staff and guests	community based non laboratory cvd risk assessment by HEW	Ethiopia, Adama	July 2022	dissemination workshops ,the purpose of this is to disseminate the result
DR Rawleigh Howe	Cebha+	USA	June 6-10,2023	poster presentation the purpose of this is to
EETB-RTP mentors and mentees	Annual meeting of EETB-RTP	Ethiopia, Bishoftu	January 25-27,2023	Oral, poster presentations of the mentee's research proposal
6 staffs from CTD and 1 from MNTD	Experience sharing for bioequivalence and clinical trial	Thailand, Bangkok	March 11-17,2023	The purpose of the visit was to benchmark BE and clinical trial service including traditional medicine organization, infrastructure, human resource and procedures.
Prof. Afework Kassu	CEPI Investors council meeting	Bali, Indonesia	September 19-21/2022	CEPI investors council meeting participation as a member
Prof. Afework Kassu, Dr.Alemseged Abdisa, Dr. Sahallo Daba, Dr.Fisum Girma	18th Grand Challenges Annual Meeting	Brussels, Belgium	October 23-26, 2022	Global Grand challenges annual meeting is a forum designed to create an opportunity in building collaborations
Dr Alemseged Abdissa	AHRI-Emory University Collaboration review meeting	Emory University, Atlanta, USA	April 25-28, 2023	AHRI and Emory has a long standing collaboration and the visit was to discuss on the status of the collaboration and discuss new opportunities
Dr Alemseged Abdissa and Mr Ashenafi Alemu	HPV vaccine project meeting	University of Melbourne, Australia	May 22-25 2023	Review and discussion on the HPV vaccine project (HIEP) and laboratory training and validation on the HPV genotyping methods
Dr Alemseged Abdissa	Innovation and Equity Forum	NIH, Washington DC, USA	July 6-7, 2023	Women Health R&D Innovation Equity Forum Steering Committee meeting to develop an opportunity map

Dr Alemseged Abdissa	Research Integrity and International Collaboration	University of Oslo, Norway	January 25-27,2023	The workshop was on Research Integrity and international collaboration and AHRI scientist was invited as a guest speaker and panelist
Dr.Shallo Daba	The launching ceremony of Grand Challenges Rwanda	Rwanda	May 18-19/2023	To share experience of Grand Challenges Ethiopia

5. LIST OF ONGOING AND NEW RESEARCH PROJECTS

5.1. List of Ongoing Projects with Funders and PIs

SN	Ongoing Research Topics	Funder
1	Important data on COVID-19 profile in Africa	EDCTP
2	Zoonotic tuberculosis	BMGF
3	HPV screening by self- sampling in a cohort of younger women in Ethiopia	Lund University
4	Pre-clinical development of killed whole cell cholera vaccine for human use from locally characterized isolates	Bio and Emerging Technology Institute
5	Enhancing local SARS CoV 2 genomic studies in Ethiopia	BMGF
6	HIV transmission in the era of scaling up access to antiretroviral therapy in Ethiopia –improved strategies for case-finding and treatment monitoring	Lund University
7	Enhancing diagnosis of acute meningitis in meningitis belt resource-limited setting, Ethiopia	African Academy of sciences
8	Nasopharyngeal Carriage of Streptococcus pneumoniae in Children with and without Pneumonia and Serotype Epidemiology of Pediatric Streptococcus pneumoniae	Pfizer
9	Enhancing TB case Detection in Addis Ababa-APOPOI	APOPO HQ
10	Immune profiling in highly exposed household contacts of tuberculosis patients	TBRU
11	TBGEN-Africa: An integrated approach to unravelling the susceptibility to TB	Welcome Trust
12	PEP4LEP : Chemoprophylaxis for leprosy: comparing the effectiveness and feasibility of a skin camp intervention to a health centre based intervention. An implementation trial in Mozambique, Ethiopia and Tanzania.	EDCTP
13	SeroSelectTB: Evaluation of the feasibility, accuracy and effectiveness of a rapid point of care serological triage test for active TB	EDCTP

14	CLR TB: Modulation of C-type lectin receptor expression by helminth infection: setting the threshold for sensing of mycobacterium	DFG/Erlangen
15	NIH/FIC Ethiopia-Emory TB Research Training Program (EETB-RTP)	NIH
16	IPIM: Exploring epigenetic alterations of cellular immunity in MDR TB with relevance for new therapy using epigenetic and immune modulating drugs.	KI
17	IRTBHHC: Characterization of innate and adaptive immune responses to mycobacterial antigens in house-hold contacts of Tuberculosis patients.	EDCTP
18	TB in Pregnancy: The role of maternal TB infection for adverse pregnancy and infant health outcomes in Ethiopia-a long-term prospective cohort study	Lund University
19	TES2021- Ethiopia In-vivo Efficacy Study 2021: Therapeutic efficacy of AL or AP plus Single Dose PQ for the treatment of uncomplicated P. falciparum and CQ or AP plus 14 days PQ for uncomplicated P. vivax	MI, USAID
20	INDIE- P. falciparum infection dynamics and transmission to inform elimination	BMGF
21	ACHIDES-African Centre for hrp2/3 Deletion Surveillance	BMGF
22	tMDA-Evaluation of tMDA and RCD on malaria transmission and elimination in Ethiopia	PMI, USAID
23	EMAGEN-Ethiopian Malaria Genomic Epidemiology Network (ARHI)	BMGF
24	AMMODO-AMMODO Science Award	AMMODO Foundation
25	VISPA- P. vivax Serology Testing Partnership	WEHI
26	OptiVivax- Optimizing a High Efficacy Plasmodium vivax Malaria Vaccine	EU
27	Drivax	Welcome Trust Fund
28	Preg-Pregnancy Malaria	Core budget
29	DPP - (Developing paediatric primaquine)	EDCTP
30	SHARP: (Improving the outcomes for individuals with severe stigmatizing skin diseases: Skin health Africa Research Program)	NIHR
31	Leishaccess: (African leishmaniasis: From clinical research to access)	EDCTP
32	CEASE: (Controlling emergent Anopheles stephensi in Ethiopia and Sudan)	LSTM
33	FA:5 : Achieving Programs in control of NTDs &AMR in Ethiopia	DGD-ITM
34	HRP (Assessing the contribution of seasonal migrant workers in selected districts of Northwest Amhara Region, Ethiopia to malaria transmission in midlands and highlands)	PATH
35	eSPT (Entomological surveillance)	BMGF
37	LAMPREG	Univ of Calgary & AHRI
38	Ethiopian Cholera Control and Prevention (ECCP)	ECCP project
39	The Economic impact of Metabolic Syndrome among People Living With HIV and Cost-Effectiveness of a Screening Intervention	CEBHA
40	Mobile app for self management of diabetes in ethiopia	Norad
41	Pharmacogenetic study or o-Mercaptopunne in acute lymphoblastic leukemia patients in Tikur Anbessa specialized hospital, Ethiopia	SDG
42	Evaluation of hormone receptors and other breast cancer by immunohistochemistry and molecular /approaches -	SDG
43	Flow and molecular analysis of Minimal Residual Disease for Childhood acute lymphoblastic leukemia	SDG
44	Prevalence of multimorbidity and Psychosocial Problems in People Living with HIV at ALERT Hospital Addis Ababa ETH	Lund University
45	Adverse effect of air pollution on pregnancy outcome	NORAD
46	Air Pollution and Health Effects of Fluoride in Water	Government
47	Glycemic control and self care behavior	Government

48	Effectiveness of proflactic vs therapeutic anticoaglution on covid 19 treatment outcome	Government
49	Model for enhancing utilization of cervical intracellular neoplasia See-and-treat services among HIV-positive women at Addis Ababa regional hospitals.	SDG
50	Molecular characterization of Vibrio cholerae responsible for cholera epidemics in Ethiopia	EBTI and Government
51	Functional and molecular characterization of aeromonas among diarrheal patients and healthy controls	Norad and Government
52	Carbapenemase and extended-spectrum β-lactamase ESBL, producing bacterial pathogens in Catheter-associated urinary tract infections among adult patients with indwelling urinary catheters	Norad and Government
53	The magnitude of ESKAPE pathogens at ALERT Hospital	Government
54	Impact of thirteen-valent pneumococcal conjugate vaccine introduction on pneumococcal carriage and disease among adult and children at Jimma University Specialized Hospital, Ethiopia	Pfizer and Government
55	Cloning, Expression, and Purification of Thermus aquaticus DNA polymerase from hot springs of rift valley, Ethiopia	Norad
56	Development of low cost, rapid point-of-care molecular test for the detection of Neisseria meningitidis in the blood sample	Grand Challenges Ethiopia and Norad
57	Molecular characterization of pharyngeal Streptococcus pyogenes isolates from febrile children in Adama and Sodo	Norad
58	Carbapenem and ESB producing bacteria across the human animal interface	Norad/Government
59	Phenotypic and molecular characterization of bacteria causing wound infections	Norad/Government
60	Understanding the molecular genetics, treatment outcome, vaccne efficacy and vertical transmission of hepatitis B virus	Norad/Government
61	Subtyping and genetic characterization of previous Dengue / Chikungunya /yellow fever virus	Norad/Government
62	Congenital Rubella syndrome	Norad/Government
63	Novel Integrated Interactive Platform for Diagnosis and Surveillance of Diseases among Migrants	Stanley Thomas Foundation
64	Brucelllosis Project	CDC
65	Jigjiga One Health Initiative	Swiss Government (SDC)

5.2. List of New Research Projects with Funders

SN	New Research Title	Funder
1	A holistic approach in patient management and epidemic surveillance through convergence of diagnostic technologies, capacity building and stakeholder engagement (HoliCare)	EU
2	Building Scalable Pathogen Genomic Epidemiology for Ethiopia (EpiGene Ethiopia)	EU
3	HPV Microbiota	Lund University
4	Developing strategies for hepatitis C in Ethiopia	NIHR
5	Improving maternal health outcomes in Ethiopia by integrating of point-of-care testing for sexually transmitted infections in antenatal care	VLIRUOS

6	Genomic characterization of Streptococcus pneumoniae serotype 19A isolates from children with pneumonia	ISPPD
7	Enhancing TB case Detection in slum areas in Addis Ababa-APOPOII	France Gov't
8	Molecular dissection of leprosy immunopathology to inform the use of novel therapeutics	Dioraphte
9	Strengthening Tuberculosis Research and TRAC mechanism	USAID
10	Barrier to TB services	Global Fund
11	PvStatem- Serological Testing and Treatment for P vivax: From A Cluster-Randomized Trial to A Mobile-Technology Supported Intervention	EU
12	VivAction	PATH
13	DBU	DBU
14	ClinHerb	Ethiopia Institute of Biotechnology through TMDRD
15	Premaquine Bioequivalence Study (PBE)	DPP project *Funding maybe reported by MNTD as well
16	Immunopathology of podoconosis	NIHR
17	Brucellosis project	Geigy Foundation

6. List of publications (n=84)

S.No	Authors	Title	Journal Name	Digital Object Identification (DOI)
1	Fujita AW, Werner K, Jacob JT, **Tschopp R**, Mamo G, **Mihret A, Abdissa A**, Kempker R, Rebolledo PA	Antimicrobial Resistance Through the Lens of One Health in Ethiopia: A Review of the Literature Among Humans, Animals, and the Environment.	Int J Infect Dis.	https://doi.org/10.1016/j.ijid.2022.03.041
2	Seyoum A, Assefa N, Gure T, **Seyoum B, Mulu A, Mihret A.**	Prevalence and Genotype Distribution of High-Risk Human Papillomavirus Infection Among Sub-Saharan African Women: A Systematic Review and Meta-Analysis.	Front Public Health.	https://doi.org/10.3389/fpubh.2022.890880
3	Legese MH, Asrat D, **Mihret A**, Hasan B, Mekasha A, Aseffa A, Swedberg G.	Genomic Epidemiology of Carbapenemase-Producing and Colistin-Resistant Enterobacteriaceae among	Antimicrobial Agents and Chemotherapy	https://doi.org/10.1128/aac.00534-22

		Sepsis Patients in Ethiopia: a Whole-Genome Analysis.		
4	Teka B, Gizaw M, Firdawoke E, Addissie A, Sisay TA, Schreckenberger C, Skof AS, Thies S, **Mihret A**, Kantelhardt EJ, Abebe T, Kaufmann AM.	A Technical Comparison of Human Papillomavirus Genotyping Assays from a Population-Based Cervical Cancer Screening in South Central Ethiopia.	Cancer Manag Res.	https://doi.org/10.2147/CMAR.S360712
5	Gissa SB, Minaye ME, Yeshitela B, Gemechu G, Tesfaye A, Alemayehu DH, Shewaye A, Sultan A, **Mihret A, Mulu A.**	Occult hepatitis B virus infection among patients with chronic liver disease of unidentified cause, Addis Ababa Ethiopia.	Scientific Reports	https://doi.org/10.1038/s41598-022-17336-3
6	Andualem H, Lemma M, Keflie A, Workeneh M, Ayelign B, Tassachew Y, Hailu L, Geteneh A, **Mihret A,** Zewdie M, **Howe R.**	Elevated KIR expression and diminished intensity of CD7 on NK cell subsets among treatment naïve HIV infected Ethiopians.	Scientific Reports	https://doi.org/0.1038/s41598-022-18413-3.
7	Gemechu G, Abagez WE, Alemayehu DH, Tesfaye A, Tadesse D, Kinfu A, **Mihret A and Mulu A**	Occult Hepatitis B Virus Infection Among Blood Donors in the Capital City of Addis Ababa, Ethiopia: Implications for Blood Transfusion Safety	Front. Gastroenterol	https://doi.org/10.3389/fgstr.2022.887260
8	Tsegaye Sewunet , Daniel Asrat , Yimtubezinash Woldeamanue, Abraham Aseffa, Christian G Giske	Molecular epidemiology and antimicrobial susceptibility of Pseudomonas spp. and Acinetobacter spp. from clinical samples at Jimma medical center, Ethiopia	Front Microbiol	https://doi.org/10.3389/fmicb.2022.951857
9	Berhanu Yitayew , Yimtubezinash Woldeamanuel , Daniel Asrat , Aminur Rahman , **Adane Mihret** , Abraham Aseffa , Per-Erik Olsson , Jana Jass	Antimicrobial resistance genes in microbiota associated with sediments and water from the Akaki river in Ethiopia	Environ Sci Pollut Res Int.	https://doi.org/10.1007/s11356-022-20684-2.
10	Tassachew Y, Belyhun Y, Abebe T, **Mihret A**, Teffera T, Ababi G, Shewaye A, Desalegn H, Aseffa A, **Mulu A, Howe R**, Liebert UG, Maier M.	Magnitude and genotype of hepatitis delta virus among chronic hepatitis B carriers with a spectrum of liver diseases in Ethiopia.	Ann Hepatol.	https://doi.org/016/j.aohep.2022.100770
11	Tucker JD, Ahmad A, **Mulu A**, Muyoyeta M, Hassan MRA, Kamarulzaman A.	Hepatitis C testing, treatment and prevention in low- and middle-income country prisons.	Nat Rev Gastroenterol Hepatol.	https://doi.org/10.1038/s41575-022-00645-3
12	Dessie BK, Mehari B, Osman M, Gari SR,	Absence of significant association of trace elements	Biometals.	https://doi.org/10.1007/s10534-022-00448-8

	Desta AF, Melaku S, Alamirew T, Goodson ML, Walsh CL, Zeleke G, **Mihret A.**	in nails with urinary KIM-1 biomarker among residents of Addis Ababa in Upper Awash Basin, Ethiopia: a cross-sectional study.		
13	Hibstu Z, **Mullu A, Mihret A**, Mengist HM.	Prevalence,Antibiogram, and Associated Factors of Bacteria Isolated From Presumptive Meningitis Patients at Debre Markos Comprehensive Specialized Hospital, Northwest Ethiopia.	Cureus	https://doi.org10.7759/cureus.28500
14	Tewachew Awoke , Brhanu Teka, Abraham Aseffa , Aminu Seman , Shemse Sebre , Berhanu Yitayew , Biruk Yeshitela , Tamrat Abebe , **Adane Mihret**	Magnitude and Molecular Characterization of Extended-Spectrum β-Lactamase Genes among Klebsiella pneumoniae Isolates in a Large Tertiary Hospital in Ethiopia	Adv Exp Med Biol .	https://doi.org/10.1007/5584_2022_739
15	Ashagre W, Atnafu A, **Wassie L, Tschopp R**, Fentahun D, Assefa G, Wegayehu T, Wondale B, **Mulu A, Miheret A, Bobosha K.**	Evaluation of the diagnostic performance of PanbioTM Abbott SARS-CoV-2 rapid antigen test for the detection of COVID-19 from suspects attending ALERT center	Plos One	https://doi.org/10.1371/journal.pone.0277779
16	Rediet Fikru Gebresenbet, Claire Kamaliddin, Zelalem Mekonnen Bekele, **Mekonnen Teferi** , Banchamlak Tegegne , Delenasaw Yewhalaw , Abebe Genetu Bayih , Dylan R Pillai , **LAMPREG Study Group**	Active case detection and treatment of malaria in pregnancy using LAMP technology (LAMPREG): a pragmatic randomised diagnostic outcomes trial-study protocol	BMJ Open	https://doi.org/10.1136/bmjopen-2021-058397
17	**Meseret Gebre, Kassa Haile,** Trevor Duke, Md. Tanveer Faruk, Mehnaz Kamal, Md Farhad Kabir, Md. Fakhar Uddin, **Muluye Shimelis**, **Bethelhem Solomon,** Abebe Genetu Bayih, **Alemseged Abdissa, Taye Tolera Balch**a, Rahel Argaw, Asrat Demtse, Abate Yeshidenber, Abayneh Girma, Bitseat W. Haile, Tahmeed Ahmed, John D. Clemens, and	Effectiveness of Bubble Continuous Positive Airway Pressure (BCPAP) for Treatment of Children Aged 1–59 Months with Severe Pneumonia and Hypoxemia in Ethiopia: A Pragmatic Cluster Randomized Controlled Clinical Trial	J. Clin Med.	https://doi.org/10.3390/jcm11174934

	Mohammod Jobayer Chisti			
18	Abraham Tamirat Gizaw, Ziad El-Khatib, Wadu Wolancho , Demuma Amdissa, Shemsedin Bamboro, **Minyahil Tadesse Boltena**, Seth Christopher Yaw Appiah, Benedict Oppong Asamoah, Yitbarek Wasihun and Kasahun Girma Tareke	Uptake of cervical cancer screening and its predictors among women of reproductive age in Gomma district, South West Ethiopia: a community-based cross-sectional study	BMC Infectious Agents and Cancer	https://doi.org/10.1186/s13027-022-00455-x
19	Esmael A, Abebe T, **Mihret A**, Mussa D, Neway S, Ernst J, Rengarajan J, **Wassie L, Howe R**.	Mycobacterium tuberculosis antigen-specific T-cell responses in smear-negative pulmonary tuberculosis patients	Clin Exp Immunol	https://doi.org/093/cei/uxac049.
20	Esmael A, **Mihret A**, Abebe T, Mussa D, Neway S, Ernst J, Rengarajan J, **Wassie L, Howe R**.	Persistent expression of activation markers on Mycobacterium tuberculosis-specific CD4 T cells in smear negative TB patients	PLOS Neglected Tropical Diseases	https://doi.org/10.1371/journal.pone.0271234
21	**Tesfaye F**, Sturegård E, Walles J, Bekele B, **Bobosha K**, Björkman P, Jansson M	Dynamics of Mycobacterium tuberculosis-Specific and Nonspecific Immune Responses inWomen with Tuberculosis Infection during Pregnancy	Microbiol Spectrum	https://doi.org/10.1128/spectrum.01178-22
22	Negera E, **Bobosha K**, Aseffa A, Dockrell HM, Lockwood DNJ, Walker SL.	Regulatory T cells in erythema nodosum leprosum maintain anti-inflammatory function	PLOS Neglected Tropical Diseases	https://doi.org/10.1371/journal.pntd.0010641
23	Urgesa K, de Bruijne N, Bobosha K, **Seyoum B, Mihret A**, Geda B, Schoenmakers A, Mieras L, van Wijk R, Kasang C, Kaba M, Aseffa A.	Prolonged delays in leprosy case detection in a leprosy hot spot setting in Eastern Ethiopia	PLOS Neglected Tropical Diseases	https://doi.org/10.1371/journal.pntd.0010695
24	Tsehaynesh Lema1, **Kidist Bobosha,** Christa Kasang, Anouk van Hooij, Addis Mengiste , AnnemiekeGeluk, Abraham Aseffa,Yimtubezenash Woldeamanuel	Increased anti-M. Leprae PGL-I igm levels in a child who developed leprosy	Ethiopian Medical Journal	https://doi.org/emjema.org › index.php › EMJ › article
25	Ephrem Mamo,**Kidist Bobosha**,Mengistu Legesse,Fufa Daba,Kitesa Debelo,	Epidemiological trends of leprosy and case detection delay in East Hararghe Zone, Ethiopia: A baseline survey	Leprosy Review	https://doi.org/10.47276/lr.93.3.184

	Taye Leta,Thomas Hambridge, Anne Schoenmakers,Robin van Wijk, Christa Kasang. Liesbeth Mieras, Jan Hendrik Richardus			
26	Lenz SM, Ray NA, Lema T, Collins JH, Thapa R, Girma S, Balagon M, **Bobosha K**, Hagge DA, Williams DL, Scollard DM, Lahiri R and Adams LB .	Utility of a Mycobacterium leprae molecular viability assay for clinical leprosy: An analysis of cases from the Philippines, Ethiopia, and Nepal	Front. Trop. Dis.	https://doi.org/0.3389/fitd.2022.967351
27	Yosef Tsegaye Dabi, Sisay Teka Degechisa, **Kidist Bobosha, Liya Wassie**	Changes in Plasma Level of Endocrine Hormones in Lepromatous Leprosy Patients	IJID Regions	https://doi.org/10.1016/j.ijregi.2022.12.002
28	Ayman Ahmed , Sayman Ahmed , Seth R Irish , Sarah Zohdy , Melissa Yoshimizu , **Fitsum G Tadesse**	Strategies for conducting Anopheles stephensi surveys in non-endemic areas	Acta Tropica	https://doi.org/10.1016/j.actatropica.2022.1
29	**Kiya Kedir, Firaol Mesfin, Hailemichael Getachew, Belachew Hailu, Bezinash Geremew**, Kufre Joseph Okop, Naomi Levitt, Rawleigh Howe	High rates of referral and voluntary clinic attendance among community members screened with high cardiovascular disease risk using citizen Science and engagement in Ethiopia	Journal of Epidemiology and Community Health	http://dx.doi.org/10.1136/jech-2022-SSMabstracts.157
30	**Kiya Kedir, Firaol Mesfin, Hailemichael Getachew, Belachew Hailu, Bezinash Geremew**, Kufre Joseph Okop, Naomi Levitt, **Rawleigh Howe**	High rates of health clinic attendance following identification of high cardiovascular disease risk using a health extension worker mediated community screening pilot study in Ethiopia	Journal of Epidemiology and Community Health	http://dx.doi.org/10.1136/jech-2022-SSMabstracts.154
31	Worku G, Gumi B, Girma M, Mohammedbirhan B, Diriba G , **Tschopp R,** et al	Drug sensitivity of clinical isolates of mycobacterium tuberculosis and its association with bacterial genotype in the SOmali region, Eastern Ethiopia	Frontiers Public Health	https://doi.org/10.3389/fpubh.2022.942618
32	Zinsstag J, Hediger K, Osman Y, Abukhattab S, Crump L , **Tschopp R**, et al	The promotion and development of One Health at Swiss TPH and its greater potential	Diseases	https://doi.org/10.3390/diseases10030065
33	Worku G, Gumi B, Mohammed birhan B, Girma M, Sileshi H, Hailu M, Wondimu A, Ashagre W, **Tschopp R**, Carruth L, Ameni	Molecular Epidemiology of Tuberculosis in the Somali Region, Eastern Ethiopia	Frontiers in Medicine	https://doi.org/10.3389/fmed.2022.960590

34	**Fiseha Wadilo, Elifaged Hailemeskel, Kiya Kedir**, Ziad El-Khatib, Phonix Constant Asogba, Tamrayehu Seyoum, Fongang Che Landis, **Rawliegh Howe, Minyahil Tadesse Boltena**	Prevalence of Group B Streptococcus maternal colonization, serotype distribution, and antimicrobial resistance in Sub-Saharan Africa: A systematic review and meta-analysis	Journal of Global Antimicrobial Resistance	https://doi.org/10.1016/j.jgar.2023.02.004
35	Salim Juma Mpimbi, Mwajuma Mmbaga, Ziad El-Khatib, Samwel Marco Tukay, **Minyahil Tadesse Boltena**	Individual and Social Level Factors Influencing Repeated Pregnancy among Unmarried Adolescent Mothers in Katavi Region—Tanzania: A Qualitative Study	MDPI Children Journal	https://doi.org/10.3390/children9101523
36	Abraham Tamirat Gizaw, Ziad El Khatib, Wadu Wolancho , Demuma Amdissa, Shemsedin Bamboro, Seth Christopher Yaw Appiah, Benedict Oppong Asamoah, Yitbarek Wasihun and Kasahun Girma Tareke, **Minyahil Tadesse Boltena**	Uptake of cervical cancer screening and its predictors among women of reproductive age in Gomma district, South West Ethiopia: a community-based cross-sectional study	BMC Infectious Agents and Cancer	https://doi.org/10.1186/s13027-022-00455-x
37	Mirgissa Kaba , Kalkidan Solomon, Yayehyirad Kitaw, Derbew Fikadu Berhe , **Alemseged Abdissa**	Contribution of the World Health Organization/ the special program for research and training in tropical disease (WHO/TDR's) in institution building: lessons from Ethiopia	BMC Health Service Research	DOI: 10.1186/s12913-023-09767-z
38	Seyoum A, **Seyoum B**, Gure T, Alemu A, Belachew A, Abeje D, Aseffa A, **Howe R, Mulu A, Mihret A.**	Genotype heterogeneity of high-risk human papillomavirus infection in Ethiopia.	Front Microbiol.	https://doi.org/10.3389/fmicb.2023.1178530
39	Gelanew T, **Wassie L, Mulu A**, Wondwossen L, Abebe M, **Mihret A, Abdissa A.**	Is heterologous prime-boost COVID-19 vaccination a concern or an opportunity for Ethiopia?	Front Public Health .	https://doi.org/10.3389/fpubh.2022.1046546
40	Dessie BK, Mehari B, Gari SR, **Mihret A**, Desta AF, Melaku S, Alamirew T, Walsh CL, Werner D, Zeleke G.	Trace Element Levels in Nails of Residents of Addis Ababa Are Shaped by Social Factors and Geography	Biol Trace Elem Res.	https://doi.org/10.1007/s12011-022-03181-y
41	Bisrat Bekele , Zekarias Masresha , Mekdelawit Alemayehu, **Berhanu**	Intravenous Immunoglobulin G (IVIG) Need Assessment Survey Toward Local	Health Services Insights	https://doi.org/10.1177/11786329231157467

	Seyoum, Liya Wassie and Markos Abebe	Manufacturing of IVIG Using a Mini-Pool Plasma Fractionation Technique		
42	Kufre Okop, Peter Delobelle, Estelle Victoria Lambert, **Hailemichael Getachew, Rawleigh Howe, Kiya Kedir,** Jean Berchmans Niyibizi, Charlotte Bavuma, Stephen Kasenda, Amelia C Crampin, Abby C King, Thandi Puoane, Naomi S Levitt	Implementing and Evaluating Community Health Worker-Led Cardiovascular Disease Risk Screening Intervention in Sub-Saharan Africa Communities: A Participatory Implementation Research Protocol	Internation Journal of Environmental Research and Public Health	https://doi.org/10.3390/ijerph20010298
43	Abel Girma Tessema, Zekarias Masresha Mengiste, Tsegaye Gebreyes Hundie, **Hailemichael Getachew Yosef**, Dawit Kebede Huluka, Abebaw Bekele Seyoum, Hannibal Kassahun Abate & **Rawleigh Craig Howe**	The effect of anti-coagulationdosage on the outcome of hospitalized COVID-19 patientsin Ethiopia: a multi-center retrospective cohort study	BMC Pulmonary Medicine	https://doi.org/10.1186/s12890-023-02375-x
44	Manyazewal T, Woldeamanuel Y, Getinet T, Hoover A, **Bobosha K**, Fuad O, Getahun B, Fekadu A, Holland DP, Marconi VC.	Patient-reported usability and satisfaction with electronic medication event reminder and monitor device for tuberculosis: a multicentre, randomised controlled trial.	EClinicalMedicine.	https://pubmed.ncbi.nlm.nih.gov/36684395/
45	Zenatti G, Raviglione M, **Tesfaye F, Bobosha K**, Björkman P, Walles J.	High variability in tuberculosis treatment outcomes across 15 health facilities in a semi-urban area in central Ethiopia.	J Clin Tuberc Other Mycobact Dis.	https://pubmed.ncbi.nlm.nih.gov/36578805/
46	Gebeyehu Assefa, Kassu Desta, Shambel Araya, Selfu Girma, Elena Hailu, **Adane Mihret, Tsegaye Hailu, Melaku Tilahun**, Getu Diriba, Biniyam Dagne, Abay Atnafu, Nigatu Endalafer, Adugna Abera, Shiferaw Bekele, Yordanos Mengistu, **Kidist Bobosha**, **Abraham Aseffa**	Drug Resistance in Tuberculous Lymphadenitis: Molecular Characterization	Tuberculosis Research and Treatment	https://doi.org/10.1155/2023/3291538
47	Habtamu M, **Miheret A**, Spurkland A	Host immune evasion by Mycobacterium tuberculosis: Current updates.	Front Immunol.	https://pubmed.ncbi.nlm.nih.gov/36582236/

48	Girma T, Tsegaye A, Desta K, Ayalew S, Tamene W, Zewdie M, **Howe R, Mihret A.**	Phenotypic characterization of Peripheral B cells in Mycobacterium tuberculosis infection and disease in Addis Ababa, Ethiopia.	Tuberculosis (Edinb).	https://pubmed.ncbi.nlm.nih.gov/36921454/
49	Musvosvi M, Huang H, Wang C, Xia Q, Rozot V, Krishnan A, Acs P, Cheruku A, Obermoser G, Leslie A, Behar SM, Hanekom WA, Bilek N, Fisher M, Kaufmann SHE, Walzl G, Hatherill M, Davis MM, Scriba TJ; Adolescent Cohort Study team; GC6-74 Consortium.	T cell receptor repertoires associated with control and disease progression following Mycobacterium tuberculosis infection.	Nature Medicine	https://doi.org/10.1038/s41591-022-02110-9
50	Teka B, Yoshida-Court K, Firdawoke E, Chanyalew Z, Gizaw M, Addissie A, **Mihret A,** Colbert LE, Napravnik TC, El Alam MB, Lynn EJ, Mezzari M, Anuja J, Kantelhardt EJ, Kaufmann AM, Klopp AH, Abebe T.	Cervicovaginal Microbiota Profiles in Precancerous Lesions and Cervical Cancer among Ethiopian Women	Microrgansisms	https://doi.org/0.3390/microorganisms11040833
51	Kiros M, Tefera DA, Andualem H, Geteneh A, Tesfaye A, Woldemichael TS, Kidane E, Alemayehu DH, Maier M, **Mihret A**, Abegaz WE, **Mulu A.**	Low level of HIV-1C integrase strand transfer inhibitor resistance mutations among recently diagnosed ART-naive Ethiopians	Science Report	https://doi.org/10.1038/s41598-023-33850-4
52	Shimelis T, **Mulu A**, Mengesha M, Alemu A, **Mihret A**, Tadesse BT, Bartlett AW, Belay FW, Schierhout G, Dittrich S, Crump JA, Vaz Nery S, Kaldor JM.	Detection of dengue virus infection in children presenting with fever in Hawassa, southern Ethiopia	Science Report	https://doi.org/10.1038/s41598-023-35143-2
53	Yared Merid, Wondwosen Tekleselasie, Emnet Tesfaye, Anteneh Gadisa, Dessalegn Fentahun, Alegntaw Abate, Aynalem Alemu, **Adane Mihret, Andargachew Mulu, Tesfaye Gelanew**	SARS-CoV-2 Infection-and mRNA Vaccine-induced Humoral Immunity among Schoolchildren in Hawassa, Ethiopia	Frontiers in Immunology	https://doi.org/10.3389/fimmu.2023.1163688

54	**Abebe M.** Aga,Demise Mulugeta,Yeweynshet Tesera,Birhanu Hurisa,Hailu Lemma,Ayele Bizuneh,Jemal Mohammed**,**Mekoro Beyene, Yimer Mulugeta,Bayeh Ashenaf,Samuel Woldekidan,Dereje Nigussie	Health professionals KAP study on rabies exposure assessment and NTV administration in Ethiopia	F1000Research	https://doi.org/10.12688/f1000research.129253.1
55	Saifu Hailu, Samuel Kinde, Michael Cross,... **Markos Abebe,.. Rawleigh Howe, Amha Gebremedhin**	Estimating prognostic relevant cutoff values for a multiplex PCR detecting BCR::ABL1 in chronic myeloid leukemia patients on tyrosine kinase inhibitor therapy in resource-limited settings	Ann Hematol.	https://doi.org/10.1007/s00277-023-05254-x
56	**Hawult T. Adane, Rawleigh C. Howe, Liya Wassie,** Matthew J. Magee	Diabetes mellitus is associated with an increased risk of unsuccessful treatment outcomes among drug-susceptible tuberculosis patients in Ethiopia: A prospective health facility-based study	J Clin Tuberc Other Mycobact Dis.	https://doi.org/10.1016/j.jctube.2023.100368
57	Awol Mekonnen Ali, Haileyesus Adam, Daniel Hailu, Marieke J. H. Coenen, **Rawleigh Howe**, Teferra Abula	Incidence and determinants of hematotoxicity in acute lymphoblastic leukemia children who received 6-mercaptopurine based maintenance therapy in Addis Ababa, Ethiopia	PLOS One	https://doi.org/10.1371/journal.pone.0286544
58	Esmael Besufikad Belachew, Adey Feleke Desta, Dinksira Bekele Deneke,...**Dareskedar Tsehay Sewasew,.Rawleigh Howe**	Clinicopathological Features of Invasive Breas t Cancer: A Five-Year Retrospective Study in Southern and South-Western Ethiopia	Medicines	https://doi.org/10.3390/medicines10050030
59	Awol Mekonnen Ali,...**Rawleigh Howe,** Teferra Abula, Marieke J. H. Coene	Genetic variants of genes involved in thiopurine metabolism pathway are associated with 6-mercaptopurine toxicity in pediatric acute lymphoblastic leukemia patients from Ethiopia	Front Pharmacol.	https://doi.org/10.3389/fphar.2023.1159307

60	Henok Andualem... Meseret Workeneh,.. **Adane Mihret**, Martha Zewdie, **Rawleigh Howe**	Elevated KIR expression and diminished intensity of CD7 on NK cell subsets among treatment naïve HIV infected Ethiopians	Science Reports	https://doi.org/10.1038/s41598-022-18413-3
61	**Aliyi Amano**, **AbiyAbebe , Eyob Debebe1, Debebe Worku** , **Samuel Tesema**, Asfaw Meresa, Terefe Gelibo , Eskziyaw Agedew, **Tesfaye Legesse1, Waktola Gobena, Kaleab Sebsibe , Tatek Kasim** , Desta Fikadu , Muluken Philiphose , Abdela Befa , Beriso Mieso , Hailu Gerkebo , **Samson Girma and Asfaw Debella**	Evaluation of medicinal plants blend formulation for symptomatic relief, phytochemical and microbiological quality and safety	Ethiop. J. Public Health Nutrition	https://doi.org/10.20372/ejphn.v6i1.355
62	Belay A Awoke T, Woldeyohannes M and **A Debella**	EVALUATION OF THE NUTRITIONAL QUALITYOF COMPLEMENTARY FOOD FORMULATED FROM LOCALLY AVAILABLE GRAINS AND MORINGA STENOPETALA IN SOUTHERN ETHIOPIA	Afr. J. Food Agric. Nutr. Dev.	https://doi.org/10.18697/ajfand.112.21865
63	Asaye Asfaw a,b,* , Ermias Lulekal b , Tamrat Bekele b , **Asfaw Debella c , Abiy Abebe c , Sileshi Degu**	Documentation of traditional medicinal plants use in Ensaro District, Ethiopia: Implications for plant biodiversity and indigenous knowledge conservation	Journal of Herbal Medicine	https://doi.org/10.1016/j.hermed.2023.100641
64	Asaye Asfaw1,2*†, Ermias Lulekal2†, Tamrat Bekele2†, **Asfaw Debella3†, Eyob Debebe3† and Bihonegn Sisay**	Medicinal plants used to treat livestock ailments in Ensaro District, North Shewa Zone, Amhara Regional State, Ethiopia	BMC Veterinary Research	https://doi.org/10.1186/s12917-022-03320-6
65	Eskeziyaw Agedew a,* , Direselign Misker b , Terefe Gelibo c , Ashenife Tadelle d , Eyasu Makonnen e , Solomon Worku f , Alemayehu Bekele g , Yelmtsehay Mekonnen h , Adamu Belay d , Feyissa Challa d , Temsgen Awoke d , Negero Gemeda d , Haregewoyin Kerebih i ,	Does Moringa stenopetala based diet consumption decrease burden of under nutrition in under-five children, Southern Ethiopia?	Heliyon	https://doi.org/10.1016%2Fj.heliyon.2022.e10285

	Simon Shiberu b , **Asfaw Debella**			
66	Mulatu Hankiso1,2*, Bikila Warkineh1 , Zemede Asfaw1 and **Asfaw Debella3**	Ethnobotany of wild edible plants in Soro District of Hadiya Zone, southern Ethiopia	Journal of Ethnobiology and Ethnom edicine	https://doi.org/10.1186/s13002-023-00588-2
67	Abdu Hassen Musa a,*,1,2 , Girmai Gebru a , **Asfaw Debella b** , Eyasu Makonnen c , Mesfin Asefa d , Samuel Woldekidan b , **Abiy Abebe b** , Boki Lengiso e , Chala Bashea e	Prenatal developmental toxicity study of herbal tea of Moringa stenopetala and Mentha spicata leaves formulation in Wistar rats	Toxicology Reports	https://doi.org/10.1016/j.toxrep.2022.10.002
68	Daniel Seifu a,b,e , Kristofer F. Nilsson a,c , Rajinder Chawla b , Solomon Genet b , Mikael Holst d , **Asfaw Debella f** , Per M. Hellstrom¨	Detection and isolation of intestinal muscle relaxant substances from the root of Taverniera abyssinica A. Rich	Journal of Ethnopharmacology	https://doi.org/10.1016/j.jep.2023.116498
69	Hussen Abdu a,* , Wondwosen Ergete b , Ashenif Tadele c , Samuel Woldekidan c , **Abiy Abebe c** , Mehari Meles d , Melese Shenkut e , Girma Seyoum	Effects of moringa stenopetala (Baker f.) Cufod leaf on reproductive organs and serum biochemical levels in male rats: An in vivo reproductive toxicity study	Phytomedicine Plus	https://doi.org/10.1016/j.phyplu.2023.100473
70	Zelalem Animaw a,* , Kaleab Asres b , **Abiy Abebe c** , Samson Taye c , Girma Seyoum a	Acute and developmental toxicity of embelin isolated from Embelia schimperi Vatke fruit: In vivo and in silico studies	Toxicology Reports	https://doi.org/10.1016/j.toxrep.2023.06.006
71	Daniel Abebe Mekonnen 1 2, Girma Shumie Abadura 3, Sinknesh Wolde Behaksra 3, Hiwot Solomon Taffese 4, Gudissa Aseffa Bayissa 4, Mikiyas Gebremichael Bulto 3, **Tesfaye Sisay Tessema 5, Fitsum G Tadesse 3, Endalamaw Gadisa 3**	Treatment of uncomplicated Plasmodium vivax with chloroquine plus radical cure with primaquine without G6PDd testing is safe in Arba Minch, Ethiopia: assessment of clinical and parasitological response	Malaria Journal	https://doi.org/10.1186/s12936-023-04562-x
72	**Sagni Challi Jira a,** *, Kholofelo L. Matlhaba b, David Ditaba Mphuthi b	Evaluating the current management approach of scabies at selected primary health care in the Deder district, Ethiopia	Heliyon	https://doi.org/10.1016/j.heliyon.2023.e12970

73	Amoako YA, Agbanyo A, Novignon J,Owusu L, Tuffour J, **Hailemichael**	Evaluation of the efficacy and cost-effective ness of high-dose versus standard-dose rifampicin on outcomes in Mycobacterium ulcerans disease, a protocol for a randomized controlled trial in Ghana	NIHR Open Research	https://doi.org/10.3310/nihropenres.13332.1
74	Ibrahim MA, Ali SM, **Tschopp R**, Zinsstag J,Pelikan K. 2023.	Efficiency in transdisciplinary cooperation; The example of the Jigjiga One Health Initiative	Trans-kom	
75	Ibrahim M, A Muhummed, H Melaku, S Mohammed, J Zinsstag, **R Tschopp**	Perception of wildlife among Somali pastoralists in Adadle woreda, Eastern Ethiopia	Journal African Ecology	https://doi.org/10.1111/aje.13050
76	Zinsstag J, K Hediger, Y Maidane Osman, Heitz-Tokpa, M Berger González, A Bucher, M Lechenne, **R Tschopp**, B Obrist and K Pelikan	The Promotion and Development of One Health at Swiss TPH and Its Greater Potential	Diseases	https://doi.org/10.3390/diseases10030065
77	**Tschopp R,** König R, Rejmer P, Paris D	Health system support among patients with ME/CFS in Switzerland	Journal of Taibah University Medical Sciences	https://doi.org/10.1016/j.jtumed.2022.12.019
78	Crump L, Ali SM, **Tschopp R,** Zinsstag J	Jigjiga University One Health Initiative. One Health Cases	CABI International 2022	https://doi.org/10.1079/onehealthcases.2022.0001
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80	**Tschopp R,** König R, Rejmer P, Paris D	*Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS): A preliminary survey among patients in Switzerland*	Heliyon	https://doi.org/10.1016/j.heliyon.2023.e15595
81	Abebe S, W Paulos, **R Tschopp**	Diabetes Prevalence and Associated Factors in the Adult Population Aged 25–64 in the Humbo Districts of Woliata Zone	International Journal of Diabetes and Endocrinology	https://doi.org/10.21203/rs.3.rs-2036732/v1
82	Nyokabi, N.S., Phelan, L., Gemechu, G.,**R Tschopp et al.**	Exploring animal husbandry in smallholder dairy systems in Ethiopia using photovoice	Agric & Food Secur	https://doi.org/10.1186/s40066-023-00420-w
83	Nyokabi, N.S., Phelan, L., Gemechu, G.**,R Tschopp et al.**	From farm to table: exploring food handling and hygiene practices of meat and milk value chain actors in Ethiopia	BMC Public Health	https://doi.org/10.1186/s12889-023-15824-3

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Total number of publications and impact factor rating, July 2022 - June 2023

Total # of publications and impact factor (IF) rating for all articles published this year per each directorate										
	MDRD	NCD	BVDRD	BVDRD& OH	CTD	MNTD	KMD	OH	VDMdRDD	TMMRD
Total publications	16	10	21	2	2	4	4	13	1	10
Total IF	167.57	48.632	167.85	15.85	4.071	19	17.2	83.25	2.75	34.304
Median	4.56	4.9	4.6	4.9	2.0355	4.9	4.52	4.08	2.75	3.41
Min.	0.134	1.89	1.2	3.75	1.379	2.7	3.7	0.1	2.75	0.204
Max.	87.24	7.8	73.08	12.1	2.692	9.3	5.1	44.5	2.75	7.2
Mean	11.17	4.8	7.99	7.925	2.0355	6.33	4.3	5.9	2.75	3.81

MDRD= Mycobacterial Diseases Research Directorate; NCD= Non-communicable Diseases Directorate; BVDRD= Bacterial and viral Diseases Research Directorate; BTBID= Biotechnology and Bioinformatics Directorate; CTD= Clinical Trial Directorate; MNTD= Malaria and Neglected Tropical Diseases Directorate