

Folder eCC_00019854 is in stage Annual_Report_Review

Name of the University, Hospital, Research Institute, Academy or Ministry

University of Napoli Federico II

Name of the Division, Department, Unit, Section or Area

Department of Veterinary Medicine and Animal Production, Laboratory of Parasitology and Parasitic Diseases
- Centro Regionale Monitoraggio Parassitosi (CREMOPAR)

City Naples **Reference Number** ITA-116

Title WHO Collaborating Centre for Diagnosis of Intestinal Helminths and Protozoa

Report Year 02-2023 to 02-2024

1. Annual report on the agreed workplan

Describe progress made on the agreed workplan. For each activity, detail (1) the actions taken, (2) the outputs delivered, as well as (3) any difficulties that may have been encountered. Three responses are expected. [maximum 200 words per activity]. Indicate, if an activity has been completed previously, has not yet started or has been placed on hold.

Activity 1

Title: Development and testing of innovative diagnostic methods for intestinal parasites

Description: This collaboration will inform WHO's work towards the identification of innovative and rapid diagnostics methods for intestinal parasites, based on sensitivity, specificity and cost criteria

Status: ongoing

To achieve the WHO 2030 targets for Soil Transmitted Helminths (STHs) control, computerized and automated approaches based on Machine Learning (ML) and Artificial Intelligence (AI) are needed to facilitate and speed up the accurate reading of microscopic slides and are expected to reduce the time and the number of personnel needed for the diagnosis.

As previously reported, the staff at CC ITA-116 has developed an advanced prototype of the Kubic FLOTAC microscope (KFM): a new compact digital microscope that is aimed at performing automated identification and counting of helminth eggs, based on ML and AI (Cringoli et al., Parasitology 148(4):427-434, 2021).

During this year, the CC ITA-116 continued to use stool samples infected by STHs to improve the performance of the KFM. Specifically, analyses were performed using FLOTAC and Mini-FLOTAC techniques, and then, the images were acquired by KFM. In addition to that, the staff at CC ITA-116 carried out analyses also on stool samples positive to *Fasciola hepatica*. To date, about 150 scans were performed, resulting into more than 4500 images (Capuozzo et al., in press).

Finally, the CC continued the evaluation of the performance of different DNA-based platforms for a specific and sensitive diagnosis of intestinal helminths and protozoa.

Activity 2

Title: Training on diagnosis of intestinal parasites

Description: WHO is expecting an drastic increase in surveillance activities in the next 5-10 years, and a large number of laboratory technicians, epidemiologist in endemic countries should be trained for this purpose

Status: ongoing

Until now, the international emergency concerning the COVID-19 pandemic did not make it possible the organization of training courses in selected endemic countries. After the end of the COVID-19 Public Health Emergency, the CC ITA-116 in collaboration with (i) Public Health Laboratory Ivo de Carneri (Archipelago of Zanzibar – Tanzania); (ii) Ivo de Carneri Foundation (Italy) and (iii) University of Lancaster (UK) are organizing a 2-week course, open to master's students in tropical medicine, public health, and geostatistical data analysis, at the Public Health Laboratory Ivo de Carneri in Pemba Island, Zanzibar (Tanzania), from 1 to 12 July 2024 (<https://maps.parassitologia.unina.it/media/pembasummerschool.pdf>).

Finally, the staff at the CC ITA-116 has continued the development and production of training materials on diagnosis of intestinal parasites (manuals, guidelines, brochures, videos, interactive training).

Activity 3

Title: At request of WHO support country for the conduction of surveys in the context of control programme

Description: Control activities for intestinal parasites are in place in more than 100 endemic countries. Many of these countries request support in utilizing the diagnostic techniques presently recommended for monitoring and for the introduction of innovative technique.

The support needed is not only in terms of laboratory diagnosis but also in terms of the epidemiologic approach for study area identification, selection of villages or schools where to collect samples, definition of sample size, method to collect, transport and preserve specimens to the laboratory and interpretation of the results.

Status: ongoing

The public WebGIS (Maurelli et al., *Geospatial Health* 16(2), 2021), developed to assist countries in conducting surveys under the Preventive Chemotherapy (PC) programmes (<https://maps.parassitologia.unina.it/>), has been constantly updated used data from various sources (e.g., JRF, EPRF, Ministry of Health reports, literature). Data from 13 new countries have been added to the database in 2023 and, to date, 87 countries result requiring PC for STHs.

To facilitate consultation and access to the global, national, and regional STH data displayed on the website, the “download” function, for graphs and maps on prevalence, morbidity and progress in STH treatment implementation, has been introduced on the WebGIS.

Furthermore, detailed reports on the changes in the endemic status of the countries involved in PC programmes are constantly sent to the NTD Control Department at WHO.

The main results are:

- A graph showing the global trend of drugs donated over 10 years (2011-2022), separated by drug (albendazole and mebendazole) and by region, has been introduced in the series of maps “Drugs donated” (https://maps.parassitologia.unina.it/drugs_donated).
- The second and the third newsletters, containing regular updates to the public GIS-based website and in-depth analysis of the progress of the PC programmes, have been published by the CC ITA-116 (<https://maps.parassitologia.unina.it/newsletters>).

2. Annual report on other activities requested

Should WHO have requested activities in addition to the agreed workplan, please describe related actions taken by your institution [maximum 200 words]. Please do not include in this report any activity done by your institution that was not requested by and agreed with WHO.

The CC ITA-116 continued to conduct regular parasitological surveillance for migrants arriving in southern Italy to assist health care decision makers in the management and control of intestinal parasite infections in non-endemic areas. These activities were implemented in collaboration with the multifunctional health centre “Elena d’Aosta” for migrants ASL-NA1 (Naples, Italy) and the migrants centres (CAS) located in the Campania region. During this year, 359 migrants were monitored, performing parasitological analysis by FLOTAC and Mini-FLOTAC techniques. A total of 53 migrants resulted positive for at least one intestinal parasite with an overall prevalence of 14.8%. To ensure the effectiveness of control measures, migrants positive for parasitic infections received antiparasitic drugs.

Finally, the CC ITA-116 was involved in the fifth annual World NTD Day (30th January 2024). On this occasion, a press release was uploaded on WHO CC ITA-116 website (<https://maps.parassitologia.unina.it/world-ntd-day-2024>).

3. Resources

Indicate staff time spent on the implementation of activities agreed with WHO (i.e. those mentioned in questions no. 1 and no. 2 above). Do not include any data related to other activities done by your institution without the agreement of WHO. Please indicate staff time using the number of “full-day equivalents” – a day of work comprising 8 hours (e.g. 4 hours work per day for 7 days should be recorded as 3.5 full-day equivalents).

Number of staff involved (either partially or fully)

Senior staff	Mid-career staff	Junior staff, PhD students
2	3	2

Number of full-day equivalents, total for all staff involved

Senior staff	Mid-career staff	Junior staff, PhD students
8	20	0

Implementation of the agreed workplan activities (i.e. those mentioned in questions no. 1 and no. 2 above) normally require resources beyond staff-time, such as the use of laboratory facilities, purchasing of materials, travel, etc. Please estimate the costs of these other resources as a percentage of the total costs incurred (e.g. if you incurred costs of USD 100 and the value of your staff time was USD 50 which makes the total of USD 150, please report 33.3% and 66.7%).

Percentage of costs associated with staff time	Percentage of costs associated with other resources	Total
40.00	60.00	100.00

4. Networking

Describe any interactions or collaboration with other WHO Collaborating Centres in the context of the implementation of the agreed activities. If you are part of a network of WHO Collaborating Centres, please also mention the name of the network and describe your involvement in that network [maximum 200 words].

The CC ITA-116 has implemented collaboration with other WHO CC (i.e. BEL-42, SWI-71, TAN-8, UNK-324) in the context of the implementation of the activities on intestinal parasites. In addition, the CC ITA-116 has been included as a partner in the Centre of Excellence for Neglected Tropical Diseases (CENTD) coordinated by the CC BEL-42 which has been approved under the 5th Call for International Thematic Networks (2020). In September 2023, a meeting between two WHO CC, UNK-324 and ITA-116, was held in Naples to define the collaboration activities. Specifically, the UNK-324 (Centre for Health Informatics, Computing, and Statistics - CHICAS) will support the ITA -116 to implement the geospatial analysis of the STH data collected in the database and showed on the website. Furthermore, in the occasion of the 73rd session of the WHO Regional Committee for Europe (24-26 October, Astana, Kazakhstan), the staff of CC ITA-116 provided a video introducing its team and highlighting its objectives (<https://www.youtube.com/watch?v=S7xMwFmedLk>). Finally, during this year, the head of the CC participated at a series of regular briefings for WHO collaborating centres to discuss together on the new strategic interventions to accelerate the prevention, control, elimination and eradication of neglected tropical diseases (NTDs).