GLOBAL NETWORK OF NATIONAL HPV REFERENCE LABORATORIES (HPV LabNet) MEETING

Virtual meeting on 2025-May-09

Attendees: 31 participants from 13 National Reference Laboratories (NRLs)

Participant	NRL
Dolores Fellner	Argentina
Maria Alejandra Picconi	Argentina
Gerald Murray	Australia
Monica Molano Luque	Australia
Ardashel Latsuzbaia	Belgium
Marc Arbyn	Belgium
Elizaveta Padalko	Belgium
Sharon Dhillon	Belgium
Inge Roukaerts	Belgium
Marcelo Soares	Brazil
Alfred Mabika	Gabon
Clementina Cocuzza	Italy
Marianna Martinelli	Italy
Iwao Kukimoto	Japan
Noe Escobar	Mexico
Milan Stosic	Norway
Gro Kummeneje	Norway
George Obregon	Peru
Lesly Solis	Peru
Maribel Acuña	Peru
Susan Espetia	Peru
Joakim Dillner	Sweden
Mònica Ortega Llobet	Sweden
Sadaf Sakina Hassan	Sweden
Sara Arroyo Mühr	Sweden
Carina Eklund	Sweden
Emel Yilmaz	Sweden
Barge, Madhuri	Scotland
Connor, Linzi	Scotland
Cuschieri, Kate	Scotland
Nannan Jiang	USA
Troy Querec	USA

NRLs summoned but not attending: France, Germany, Rwanda, Slovenia

MEETING NOTES

1. INTRODUCTION

Joakim welcomed the participants, particularly the 3 new members Brazil, Mexico, Gabon, and thanked them for willingness to collaborate.

2. NEW NRL MEMBERS (Brazil, Mexico, Gabon)

Brief introduction of the new NRLs. Their activities can be seen below.

3. GENERAL UPDATES

3.1 Expanding the LabNet

The rationale and strategy for expansion of the HPV LabNet was outlined and discussed. We must have a focus on ensuring continued high impact of the HPV LabNet by ensuring high quality and consistency among new members. All new NRLs inthe LabNet must be officially appointed as NRL by their national authorities. There is also a set of minimum quality requirements on the members, to maintain the standard of excellence across the network. These include:

- Participation in annual HPV proficiency testing
- Active attendance at LabNet meetings
- Commitment to collaboration and knowledge-sharing across the network

Focus on LMICs

There is a focus particularly on expanding the LabNet with NRLs from low- and middle-income countries (LMICs), because efforts to control cervical cancer are most urgently needed in LMICs. As for all members, NRLs should be formally nominated by their national authorities.

Expansion Strategies

Two main strategies for LabNet expansion were outlined:

a) **LabNet-driven outreach**: Existing LabNet members are encouraged to leverage their own networks to identify suitable NRLs that could be included.
b) **Collaboration with ICSN**: A formal collaboration is established with the International Cancer Screening Network (ICSN). ICSN was initially launched by the U.S. National Cancer Institute and has grown to include members from over 70 countries. Over the past years, ICSN has increasingly focused on LMICs. The ICSN Working Group on HPV Screening is currently chaired by Ethiopia.

Joint Session at the upcoming ICSN Meeting: The HPVLabNet and the ICSN Working Group on HPV Screening has a joint session at the upcoming ICSN annual meeting, which will take place in Denmark on **June 18-20, 2025,** **ICSN 2025 - ICSN**. The joint session will be hybrid, allowing virtual participation. All HPV LabNet members are encouraged to attend. Online attendance is free of charge. An invite is sent in a separate email.

3.2 HPV laboratory emanual and e-learning resources

The *HPV Laboratory eManual* is now published and accessible online: (Welcome to the HUMAN PAPILLOMAVIRUS E-LABORATORY MANUAL (1st Edition) – International Human Papillomavirus Reference Center). A short communication describing the manual has also been submitted to the *Journal of Clinical Virology*. Co-authors have been reminded to confirm their affiliations, as requested by the journal, to ensure a smooth revision process.

This manual is a *living document*, and new chapters are welcome. Chapters currently in development or proposed include:

- **Setting Up a Laboratory**: A collaborative chapter with contributions from Germany, Argentina, Brazil, and the UK. The final draft is currently under review by the German team. Once finalized, it will be sent to Brazil to contribute the use case, followed by a final review by the UK team.
- **WHO target product profile for HPV screening tests**: Lead: Maribel Almonte (WHO).
- **HPV Proficiency Panels:** Lead**:** Carina Eklund (Sweden)
- **Assay validation:** Leads: Sharon Dillon (Belgium) and Alejandra Picconi (Argentina)
- **Registry:** Lead: Sara Nordqvist Kleppe (Sweden)
- **Next-Generation Sequencing (NGS):** Leads: Kate Cuschieri (UK), Sara Arroyo (Sweden) and Milan Stosic (Norway).

Those interested in contributing to existing chapters or proposing new ones are encouraged to contact **Sara Arroyo** at sara.arroyo.muhr@ki.se.

In addition, contributors are encouraged to develop **e-learning modules** based on their chapters, as has been done for Chapter 2. Please reach out to Sara if you would like to be involved in developing e-learning content.

Finally, a note has been added to the bottom of the manual's webpage inviting readers to report any errors or feedback directly to Sara Arroyo. Maribel Almonte has already provided feedback for all chapters and that is being incorporated.

3.3 International LabNet study on optimal limit of detection (LoD) in HPV screening

Overview:
Preliminary results were presented and are based on data reported so far from five participating NRLs: Sweden, Belgium, France, Italy, and Slovenia.

Preliminary conclusion on optimal LoD Values (IU or copies/µL):

HPV16 & 18: 10 IU/µL

HPV31, 33, 35, 45, 52, 58: 25 IU/µL

HPV39, 51, 56, 59: 100 copies/µL

Alternative LoDs investigated (CIN2+ as outcome)

- Maximum analytical sensitivity (LoD = anything detected) using **all oncogenic types**:
  → Sensitivity: 97%
  → Specificity: 83%
- Using LoD thresholds of 10IU /µL (16/18), 25IU/ul for 31, 33, 35, 45, 52, 58 and 100 copies/ul for the other oncogenic HPV.
  → Sensitivity: 87%
  → Specificity: 92%
- Screening **only for 8 types** at 10/25 IU/µL:
  → Sensitivity: 79%
  → Specificity: 94%

Shifts in HPV Type Distribution in CIN2+ Lesions

- Increasing proportion of CIN2+ cases caused by **types with lower oncogenic potential**, in vaccinated populations where HPV16/18 is becoming rare.
- Suggests a **declining clinical benefit** of detecting CIN2 especially as **low oncogenic types** become more prevalent in remaining CIN2 lesions.
- **Conclusion** is that we must use data on importance of HPV types from the pre-vaccination era.

***Comments from Italy:** Limit of Detection (LoD) should be in relation to the number of cells in the sample, not input volume in microliters.

-Discussion: Input volume in microliters was used because most HPV tests take a fixed amount of microliters from the sample. However, an LoD in relation to the number of cells is more scientifically appealing. We agree that both methods will be used and presented in the paper.

***Comments from Belgium:** The clinical endpoint should be prevention of CIN3+, not including CIN2. The benefit of CIN2 detection is more debatable. Discussion: We all agree that the international recommendation to not report CIN2 and CIN3, but only report HSIL, is most unfortunate. However, as there are only HSIL being reported nowadays we are unable to focus on CIN3.

3.4 Evaluation of novel HPV assays

For cervical cancer elimination, several billion women worldwide need access to HPV screening, especially in low- and middle-income countries (LMICs). However, the costs of HPV screening is prohibitive in many settings. But developing HPV tests is not inherently difficult and there is a vast amount of creativity and innovation happening globally. A major bottleneck is the lack of a rapid and inexpensive evaluation process for new HPV tests.

Our goal is therefore to establish an internationally standardized and recognized virological evaluation process for novel HPV assays used in screening.

Main Strategy:

- Utilize defined amounts of International Standards (IS) of HPV DNA, containing virus types and amounts optimal for cervical cancer prevention. This will ensure high sensitivity for detecting high-risk precursors and cancers, while also maintaining high specificity.
- Create a global HPV LabNet Test Validation panel, traceable to IS preparations of DNA with defined amounts (International Units). This will allow for the reproducibility of evaluations over time and will make the evaluations more internationally comparable.

The first version of the test evaluation panels will include 13 HPV types, in serial dilutions, to determine the Limit of Detection (LoD) of the assay and reproducibility of the LoD of the assay (in triplicates).

This validation panel will be included in the clinical validation initiative "VALGENT," as an added virological and analytical requirement.

Preliminary Analysis (based on the international LabNet study of LoD):
The preliminary analyses suggest the following Limits of Detection (LoD):

- 10 IU/µL for HPV types 16 and 18
- 25 IU/µL for HPV types 31, 33, 35, 42, 52, and 58
- 100 GE/µL for other genotypes (HPV types 39, 51, 56, 59, and 68).

We will perfom a Beta-testing of the panel at Karolinska Institutet, Sweden (Q2 2025) and a Real-life testing of the panel on several novel HPV assays (Q3-Q4 2025)

***Comments from Scotland:** We need to consider the use of cells in the test evaluation panel. Clarification/Response: Currently, in our proficiency panel (PP) testing, we mix HPV DNA with human placental DNA in the amounts that are typically found in clinical samples. However, placental DNA is too easy. Real biospecimens may e.g. contain inhibitors. Therefore, we have in the PP incorporated samples from C33A cells, which are HPV-negative. A key issue is ownership and intellectual property: if we use a cell line not owned by us, it could cause problems in validation, especially if a competitor's assay was validated using a cell line they do not own. Ideally, it would be best to use a non-proprietary cell line, but we have so far not located one.

***Comments from Belgium:** The VALGENT initiative processes about 1,000 smears per year. These are fully genotyped samples with high viral loads that are diluted to medium loads. Then, 10 aliquots of such samples, each with different genotypes, are distributed to several VALGENT

labs to ensure consistency. These are real clinical samples, which ensures the robustness of the data.

<u>*Comments from Argentina/Australia:</u> MA Picconi underlined that extrapolation of detection of virus to detection of the relevant cancer precursors may be difficult. Monica Molano (Australia) expressed her agreement in the chat.

4. UPDATES FROM EACH NRL (chronological order)

ARGENTINA

- **Supporting HPV Vaccination: Generating Data on Circulating HPV Types**
    - Ongoing research on the circulation of HPV types in young women.
    - Initial steps underway to collect HPV type data in young men, supporting evidence-based vaccine policy.
- **Supporting HPV-Based Cervical Cancer Screening**
    - Since 2022, the Argentinian team has coordinated national participation in HPV proficiency panels:
        - *2022*: 19 laboratories from Argentina and 1 from Bolivia (HC2 testing)
        - *2023*: 18 laboratories from Argentina and 4 additional labs from other South American countries
        - *2024*: 20 laboratories from Argentina and 4 from other South American countries
    - Strong engagement in local interlaboratory comparison studies, with consistent participation since 2020.
    - Ongoing challenges with the sustainability of HPV screening programs, primarily due to the cost of tests and reagents. There is an urgent need for affordable HPV testing options to ensure program continuity.
    - Development of a tool to evaluate the clinical performance of new HPV tests is in progress.
    - Continued collaboration with PAHO to strengthen quality assurance (QA) and implementation strategies for HPV testing.
    - Exploratory work includes HPV detection in plasma samples.
    - A pilot study on HPV detection for anal cancer screening is being carried out among high-risk populations.
    - An internship on Whole Genome Sequencing (WGS) using NGS technology is ongoing at the International HPV Reference Center (IHRC).
    - Two manuscripts are currently in preparation: HPV genotyping in head and neck cancers (HNCs), HPV type distribution in women post-vaccination implementation

AUSTRALIA

- **Generating annual Quality Assurance Panels (using clinical samples) for the Royal College of Pathologists Australasia, sent to ~ 60 laboratories.**
- **Supporting a project in Ethiopia**
    - Led by Suzanne Garland and Kim Mulholland
    - HPV genotype prevalence
    - vaccine effectiveness
- **Genotyping and detection for vaccine effectiveness in Fiji**
    - retrospective cohort study led by Fiona Russell
    - focus on a single dose cohort
    - ~17 years post vaccine
- **Evaluation of biomarkers in anal cancer – ongoing studies, Monica Molano**
- **Developing biomarkers in cervical cancer (submitted grant application) (**Led by Monica Molano)
    - Identification of novel methylation biomarkers for cervical screening in Latin America
    - Focus on self-collected samples, LMIC
    - In collaboration with laboratories in eight countries (Australia, Honduras, Costa Rica, Colombia, Peru, Bolivia, Paraguay, Argentina)
    - Includes some LabNet colleagues, Alejandra Picconi, María Dolores Fellner, Rita Mariel Correa

BELGIUM

The National Reference Laboratory in Belgium operates as a consortium composed of three institutions: Sciensano, the University of Ghent, and the Algemeen Medisch Laboratorium (**AML**).

- **University of Ghent (Elizaveta Padalko):**

  Belgium has introduced primary HPV testing and is actively engaged in collaborative work with LMICs. Their webpage resources are widely accessed, particularly the FAQ section on assay performance, hosted via the Sciensano webpage. Coordination is led by Sciensano.

- **Sciensano (Marc Arbyn):**
  Efforts are underway to strengthen integration across vaccination, screening, follow-up, and cancer registries. The team is working closely with policymakers and key stakeholders, aiming to replicate successful models such as the Swedish approach. Although Belgium currently faces challenges in linking vaccination and screening data, there is optimism for meaningful progress in the coming year.

BRAZIL

- The NRL is leading the validation of a Brazilian-developed HPV test kit, intended for use within the national public health system (SUS) for primary HPV screening.
- Active work is ongoing to assess the evolution of HPV screening assays and to evaluate HPV type prevalence among women of reproductive age, in collaboration with the Ministry of Health.
- Cancer samples from INCA and from collaborators elsewhere in the country are being genotyped using whole genome sequencing as part of the Brazilian Cancer Genome Project, with a focus on HPV-driven cancers. The project includes comprehensive multiomic analyses to identify biomarkers associated with cancer progression and to investigate HPV-negative cancers and their mutational signatures.
- Specific efforts to target hard-to-reach populations, including communities in the Amazon region.
- The Cancer Institute of São Paulo State (ICESP) is also running impactful programs to raise awareness around HPV and HPV vaccination, including initiatives showcased at IPVS, and which the NRL is joining.

GABON

- HPV screening has been ongoing since 2022, integrated into routine laboratory practices and supported by national campaigns.
- Every October, a national cervical cancer screening campaign is held, during which all services are offered free of charge.
- HPV testing is available not only in the capital but also in the provinces, across 52 screening sites. Triage methods include visual inspection with acetic acid (VIA) and Pap smears.
- Although HPV vaccination has not yet been implemented by the Ministry of Health, efforts are underway to build an evidence base to support introduction.
- Prevalence data collected since 2022 from 2,500 women (aged 18–49) show an overall HPV prevalence of 17%. Among these, Gardasil-9 vaccine types account for approximately 60% of infections. The most common genotypes identified are HPV52 and HPV35.
- A key challenge is the shortage of anatomical pathologists, with only four available in the entire country. There is growing interest in adopting AI-assisted cytology tools to address this gap and manage test sensitivity.
- A follow-up strategy is in place: women testing positive are retested at 6 and 12 months. Additionally, capacity-building initiatives are ongoing to train biologists and expand screening capabilities.

JAPAN:

- **HPV Type Surveillance**
    - Ongoing monitoring of HPV type prevalence to assess the impact of bivalent HPV vaccination in Japan.
    - Notable detection of breakthrough infections with HPV52 and HPV58, despite being negative for HPV16 and HPV18, indicating possible gaps in bivalent vaccine coverage.

    - Continue to examine whether HPV16/18-positive breakthrough infections can be seen.

- **HPV Serology Studies**
    - Monitoring the persistence of antibody titers in vaccinated women using in-house VLP ELISA with international standard sera.
    - Almost all women positive for HPV16 antibody more than 10 years after vaccination.
    - Observations suggest a decline in HPV18 antibody levels in some individuals, raising the question of whether booster doses may be necessary.
- **Proficiency Testing**
    - Participation in and coordination of proficiency studies to ensure quality and consistency in HPV testing methods.

ITALY

- **Clinical Focus**
    - Studying women referred for colposcopy due to recent cervical dysplasia, with an emphasis on those already vaccinated.
    - Investigating intragenotype HPV variants in this population and other potential biomarker to be used for monitoring HPV infection such as viral load, oncogenic transcript and circulating HPV DNA in blood
    - Participating to a Regional Pilot Study for the evaluation of the screening based on offering self-collected samples
    - Evaluation of potential molecular biomarkers and of liquid-biopsies (blood and saliva) for the diagnosis and post-treatment follow-up of HPV-associated Head and Neck Cancers as part of a multicenter national clinical study.
    - Prevalence of HPV infections and other STIs in pregnant women in a local clinical study
- **Validation Studies**
    - Participation to reproducibility studies for the clinical validation of new HPV assays
    - Conducting validation of self-collected sampling methods, using reference samples from the European VALHUDES study.
- **Working Group on Challenging Samples**
    - Co-led by Clementina and Mario Poljak, this group is focused on the development and classification of challenging samples, particularly those with insufficient cellular content—which should be considered invalid, not negative.
- **Working Group on Ct thresholds**
    - Assessing positivity rates in relation to Ct thresholds, to improve interpretation of borderline or low-positive results. While initially based on an Italian dataset, this work is now expanding internationally.

- Sweden has already contributed a dataset, with kind permission from Joakim Dillner, including BD test Ct values from Stockholm's screening program (both clinician-collected and self-collected samples), and other HPV testing studies conducted over the past three years. The group is actively seeking additional datasets from National Reference Laboratories (NRLs) that include Ct values, to support broader comparative analysis.

MEXICO

- **Primary Screening**
    - Mexico performs primary HPV screening on approximately 900,000 women per year, with a positivity rate of 12–13%.
- **HPV Genotype Surveillance**
    - A bibliographic review performed by the laboratory (manuscript in preparation) indicates a shift in prevalent genotypes, particularly in the southwest region, where HPV 51 and 58 are becoming more common.
    - In the general population, HPV 31 also remains highly frequent.
- **Genomic Characterization**
    - Undertaking genetic and genomic analyses of prevalent genotypes.
    - Noted that information on intratypic variants remains limited in Mexico.
    - Using different in-house amplification strategies to target the HPV whole genome and/or informative genomic fragments for sequencing.
- **External quality control**
    - The network of the national prevention program includes 32 laboratories for the molecular primary screening.
    - Experience in the design of synthetic proficiency panels based on quantified plasmid DNA (containing target genes of different HR-HPV), inoculated in ThinPrep Preservcyt vials for the evaluation using the Cobas 4800 system in the laboratory network.
- **Evaluation of commercial automated systems for HPV screening**
    - Laboratory performs diagnostic and analytical evaluation of commercial kits for HPV screening and genotyping (verification of agreement, sensitivity, specificity, limit of detecton, selectivity and reproducibility) by using clinical samples and plasmid DNA.
- **Future Directions**
    - Aiming to extend findings from cervical screening to include other HPV-related cancers in the future.
    - Implementing a novel surveillance system to monitor HPV genotype distribution nationally.

NORWAY

- **Vaccine Surveillance progress Screening and Sampling Progress**
    - HPV-genotyping from cases of CIN, ACIS and cervical cancers
    - Reached 10,000 samples milestone.
- **Implementation of Self sampling in Norway**
    - The HPV-reference laboratory is involved in quality assurance of the implementation process
    - Observed a notable increase in self-sampling participation after including the long term non-attenders.
- **Quality Assurance Project**
    - Initiated a QA project focusing on HPV-negative cancers, spanning samples from 2015 to present.
    - Laboratories across Norway have been notified and are expected to participate in this review by sending samples to the HPV reference laboratory for analysis
- **Biobank Initiative**
    - Currently preparing an application to establish a biobank, aimed at supporting HPV-related research and QA efforts.
- **International Collaboration**
    - New Active collaboration with Zimbabwe, investigating HPV-positive samples collected from multiple anatomical sites within the same woman using TaME-seq. Currently obtaining all necessary approvals.
    - LabNet collaboration with Sweden, Peru, Argentina on HPV-whole genome sequencing of samples from Peru.

PERU

- **National Screening Program**
    - HPV screening is performed using COBAS, introduced in 2021.
    - Current coverage is 81% of the target population.
    - Currently, 25 operational laboratories across the country – The plan is to have one per region.
- **Capacity Building and Quality Assurance**
    - Proficiency panels are scheduled for 2025.
    - Training activities ongoing, including support from the IHRC both for NGS and Tameseq (HPV lineages, SNPs, intrahost variability and integration) as for the proficiency panel production.
    - Developing a Good Practice Manual for HPV detection in peruvian national laboratory network

- **Data Integration and Surveillance**
    - Working in collaboration with the Ministry of Health to improve interoperability of systems and ensure access to screening data.
    - Implementing a pilot surveillance program for circulating HPV genotypes, with the aim to scale up nationally.

- **Research Activities**
    - Ongoing evaluation of HPV genotypes and associated risk factors in the Peruvian* Amazon-preliminary findings were presented at EUROGIN 2025.
    - Publications underway, 2 papers in progress: Genotyping + Tameseq analysis and risk factors associated with HPV infection, both in a peruvian amazon region (Loreto).
    - Studies include work using the Luminex methodology for comparison of molecular HPV detection methodologies for third publication.

SCOTLAND

- Scotland has signed on to the Cervical Cancer Elimination Strategy.
- Ongoing work on biomarker research projects for clinician and self taken samples
- Continue to act as WHO prequalification lab for HPV tests – protocol for DNA tests in process of update
- Active surveillance work includes measuring the impact of 4 v vaccine in female screening population and also the impact of vaccine as a result of the GBMSM opportunistic vaccination programme which started in 2017 (presented at Eurogin).
- Drafting guidance on the use of liquid biopsies, particularly for detecting HPV in blood using digital PCR.
- Since 2022, genotyping of cervical cancer cases has been conducted, including NGS for HPV-negative case
- Interested in online resources and their development.
- Exploring the potential implementation of HPV testing in anal samples.
- Suggestion for as LabNet, create a task force that provides support to laboratories beginning HPV testing activities.

SWEDEN

- Proficiency Studies Overview

Screening Proficiency Panel

A total of 132 laboratories submitted 208 datasets (compared to 95 laboratories in 2023). 197 out of 208 datasets were 100% proficient (94.7%), up from 91% proficiency in 2023. The technical report will be soon published at: Reports – International Human Papillomavirus Reference Center

Genotyping Proficiency Panel

Up to 96 laboratories submitted 169 datasets (in 2023: 95 laboratories, 142 datasets). 137 out of 169 datasets were 100% proficient (81.1%), showing improvement from 79% in 2023. The technical report will be soon published at: Reports – International Human Papillomavirus Reference Center

Registration for 2025 Proficiency Panels

Registration is open since April 22, 2024, and will close on June 22, 2024. Distribution of panels will begin in October 2025. Laboratories can subscribe directly at: www.equalis.se

Note for NRLs:

National Reference Laboratories (NRLs) do not need to register via Equalis. Instead, they can contact Carina Eklund directly to receive the panels free of charge (carina.eklund@ki.se). NRLs are encouraged to request multiple panels to be used in national or regional proficiency testing organized by the NRL.

Future aim:

Nationally organized proficiency testing to be managed by the country NRLs. The International HPV Reference Center (IHRC) will help NRLs to set up this testing and support them, but will send out PP only to the parts of the world that do not have an NRL.

- Support and Training

- All NRLs are welcome to request training. The IHRC has recently hosted (within the last 2 months) coworkers from the NRLs of Norway, Argentina and Perú, for NGS training including variant lineages, intrahost variation and integration. In addition, the Peruvian NRL is currently at the IHRC for training in the design and production of proficiency panels.

- Swedish Reference Laboratory

The Swedish Reference Laboratory continues performing confirmatory testing for HPV-negative HSIL+ cases from laboratories all over Sweden. In the first four months of this year, 13 samples from 9 patients have been received. 6 samples were positive by the NRL PCR.

US CDC NCEZID/DHPCC/CVDB Human Papillomavirus (HPV) Lab Research and Surveillance Activity Meeting Notes

Ongoing Collaborations and Studies:

- NHANES Resumption: Restarted surveillance of HPV in the general US population with genital and oral samples.
- Other national research activities include:
    - HPV typing within a broader Oral Microbiome and Periodontitis (OMAP) study.
    - Cervical and anal HPV in HIV-positive women.
    - Anal cancer screening with university collaborations.
    - HPV types in high-grade cervical precancers and cancers.
- Botswana Vaccine Impact Study: Assisted University of Botswana with preliminary analysis of HPV antibody titers among vaccinated and unvaccinated.
- GLOBE-HPV Project: CDC provided technical guidance for South Asia and Sub-Saharan Africa. These collaborators competed testing for cross-sectional studies to compare first-void urine to self-collected vaginal swabs HR-HPV results. Longitudinal studies of HPV incidence and prevalence are underway.
- Microneedle Vaccination Study: Georgia Tech study shows promising antibody responses in mice using a bi-valent HPV microneedle patch.

Method Development and Testing:

- Microsampling Techniques: Testing shows potential for alternative HPV antibody detection.
- Cost Reduction in eWGS: Achieved a 20% cost reduction in enriched HPV whole genome sequencing.

Surveillance and Data Management:

- NGS Improvements: Enhancing bioinformatics for HPV genome analysis with GA Tech.
- Quality Management Transition: Implemented a new electronic quality management system.

Challenges:

- Adjusting to staffing reductions and updates to purchasing policies have delayed testing for international viral limit of detection study

Conclusion: CVDB's HPV research and surveillance efforts are progressing through collaborations and innovative methods, aiming to provide data to inform US HPV public health policy and strengthen international partners with their own HPV surveillance.

5. FUTURE OF HPV LABNET

Vision for HPV LabNet:

- **Global Proficiency Testing**: The LabNet will continue to offer proficiency testing schemes for both HPV screening and genotyping. These will be primarily managed by national reference laboratories (NRLs), with the international network focusing on supporting countries without NRLs.
- **HPV LabNet Manual**: The creation of a global consensus document on quality assurance will be a central task. This manual will serve as a reference for global standards in HPV testing.

Important Activities to Pursue:

- **Advancements in Technology & Surveillance**: Networking efforts will focus on staying up-to-date with advancements in HPV screening technologies and surveillance practices. New activities already underway include assisting national authorities with evaluation reports for new HPV tests. If consensus is reached on best practices, this will lend credibility to the efforts and outputs, which may help in the efforts to provide LMICs with affordable yet reliable HPV screening tests. If NRLs are interested in being early adopters of new evaluation protocols or technologies, they can express interest in joining this initiative.

Other Activities and Ideas for Consideration:

- Monitoring HPV Prevalence:
    - Monitoring changing HPV prevalences in screening populations is essential, especially in the wake of vaccination programs. Many countries are seeing a decline in HPV prevalence due to vaccination efforts, but the quality of HPV tests used in different settings is often not well understood. Epidemiological biases can arise when sampling does not come from screening populations, leading to skewed data.
- Collaboration on HPV Prevalence Data: Several NRLs are presenting data on HPV prevalences from high-quality screening programs. A coordinated international effort could provide ongoing, comprehensive data on trends in HPV prevalence globally.
- Additional Ideas?

Next meeting will be scheduled in 6 months. Sara will send a doodle to everyone.

From the meeting notes and emails from the NRLs, the following WG are established:

PROJECTS WORKING GROUPS

We are moving forward with several key projects and working groups, If you're interested in any of the groups listed below, or if you have suggestions for new ones, please get in touch with me at sara.arroyo.muhr@ki.se by June 6th. Work will begin on June 7th.

- Laboratory manual new chapters: (See section above)
- Laboratory manual e-learning courses: Sweden, UK, Norway
- Manuscript on NGS consensus and quality assurance (UK, Norway, Sweden)
- Consensus pipelines for NGS (UK, Norway, Sweden, Brazil, Peru, USA, Brazil, Italy, México, Belgium (Univ. Ghent: Elizaveta and Hamerlinck Hannelore)
- Sample adequacy (Ct values): Italy, Sweden, Peru
- Sample adequacy (challenge samples) Slovenia, Italy, Sweden,
- HPV negative tumors (multi-omics) Norway, Sweden, Brazil, UK
- HPV 73 cervical cancers: Norway, Sweden
- L1 deletions in cervical cancer: Australia, Norway, Sweden
- Assured HPV Kit: France
- Regression/progression biomarkers: Sweden
- Advisory task force for HPV testing in new countries.: Lead: UK