Executive Summary

In September 2019, a broad group of stakeholders met in London to finalize the shared strategy, *Defeating Meningitis by 2030: a global roadmap*. The meeting brought together more than 110 representatives from ministries of health, government agencies, pharmaceutical companies, non-governmental and civil society organizations, academia, funding agencies, UNICEF and the World Health Organization (WHO). Participants came from **29 countries and all regions of the world**. All advocated strongly for action against meningitis.

**The challenge**

Meningitis remains a **feared disease around the world**, causing an estimated 5 million new illnesses and 290,000 deaths each year. Meningitis leaves serious after-effects such as hearing loss, visual impairment, brain damage, and loss of limbs, that cause long-term difficulties for survivors and for their families. Epidemics of meningitis are devastating for health systems, the economy, and society.

Recognizing this burden, advocates and stakeholders have sounded a call for action to **“Defeat Meningitis by 2030”**.

**The roadmap**

In answer to this call, a wide range of stakeholders touched by meningitis have defined a global roadmap to move toward a **world free of meningitis**. The **five pillars of the roadmap** are 1) prevention and epidemic control, 2) diagnosis and treatment, 3) disease surveillance, 4) support and care for people affected by meningitis, and 5) advocacy and engagement.

The meningitis roadmap is a global strategy to tackle a global problem. Led by WHO, it builds on a **history of successful partnerships** between researchers, pharmaceutical companies, public health experts, governments and funders. It has been **refined and strengthened** by technical experts, patient groups, WHO advisory groups, and through a web-based public consultation and a survey of patient groups that together garnered more than 600 responses in 9 languages from over 90 countries.

**This consultation**

Participants at the London meeting considered the **many challenges to defeating meningitis**, including the need for more affordable and widely available vaccines to prevent the causes of meningitis; insufficient capacity to diagnose and treat the disease, particularly in low resource settings; cultural and religious barriers that limit vaccination or seeking healthcare; and huge gaps in access to supportive services for people dealing with the after-effects of meningitis.
To finalize the roadmap, delegates resolved open questions, prioritized key activities, and identified “quick wins” with the potential for early success. They considered its feasibility and challenges, advised on implementation, and identified partners who could contribute to each pillar. Their advice will ensure the roadmap is realistic, action-oriented, and poised for implementation.

**Designed for success**

To meet its challenges, the roadmap is specifically designed to be:

- **Concrete and practical.** The roadmap focuses on what is feasible to achieve and aims for quick wins as well as long-term benefits.

- **Balanced and comprehensive.** It includes prevention as a key priority, as appropriate for a disease that strikes without warning and devastates rapidly. At the same time, because vaccines are not yet available to everyone at risk of meningitis, the roadmap also promotes diagnosis, treatment, and outbreak detection and response.

- **Health systems-based.** The roadmap embeds focused, disease-specific strategies within the broader primary healthcare system in order to expand access to integrated health services at the community level.

- **People-focused.** Community awareness of meningitis plays an important role in the strategy, helping people with meningitis to get the rapid care they need and building political support for prevention programs. Unlike previous health strategies, the roadmap calls for support for people dealing with the after-effects of meningitis as an intrinsic part of disease control.

**Path to implementation**

After review by the WHO Strategic Advisory Group of Experts on Immunization in October 2019, the roadmap will be revised to support the submission of a corresponding resolution to the World Health Assembly, through the WHO Executive Board in February 2020. Regional stakeholders will then prepare Regional Implementation Frameworks to translate the strategy into concrete next steps at regional and country levels.

Implementation will be supported globally through the development of a business plan, a monitoring and evaluation framework, and a communication plan to align on consistent, powerful messages about the need to defeat meningitis. WHO will assemble highly committed global sponsors into a Strategy Support Group to advise on implementing the roadmap. Connections will be established with other global programs, including initiatives in immunization, infectious diseases, antimicrobial resistance, disability rights, child health, primary healthcare, and universal health coverage.

**Commitment to succeed**

Those in attendance emphasised the timeliness of this joint effort and the importance of setting a global agenda and pledged their commitment to the success of the roadmap. The consultation closed with a call to all participants to **take action to defeat meningitis**.

“Together we will win.”
Full Report

Context for this meeting

1. Meningitis causes an estimated 5 million new cases and 290,000 deaths each year. Up to one-third of meningitis survivors suffer serious long-term after-effects such as hearing loss, visual impairment, brain damage and limb loss. Meningitis epidemics are devastating for health systems, the economy, and society and can strike anywhere.

2. In May 2017, over 50 representatives from governments, global health organizations, public health bodies, academia, the private sector, and civil society called for a global vision to “defeat meningitis by 2030”.¹ In September 2017, 200 representatives from the 26 countries of the African meningitis belt amplified this call and highlighted the need for equitable access to meningitis vaccines. These country representatives repeated their call and committed to defeat meningitis at their subsequent annual meetings in October 2018 and October 2019.

3. WHO has coordinated the response to this call to action, assembling a Technical Taskforce to draft a global roadmap to align stakeholders around a new, shared strategy to defeat meningitis. The roadmap was refined by experts in meningitis, health, and disability at an extended taskforce meeting in February 2019 and strengthened through a web-based public consultation and a survey of patient groups that garnered more than 600 responses in 9 languages from over 90 countries.²

4. This Stakeholder Consultation in September 2019 was the next step in advancing the roadmap. It brought together more than 110 representatives from ministries of health, government agencies, pharmaceutical companies, non-governmental and civil society organizations, academia, funding agencies, UNICEF and WHO. Participants came from 29 countries and all regions of the world.

5. The objectives of this consultation were to:
   - Finalize the roadmap
   - Identify priority activities, enablers, and challenges in implementation
   - Discuss a framework for strategy implementation

6. This report summarizes the broad discussions of the roadmap and its path forward for implementation. More detailed discussions from group work on each strategic pillar are summarized in Annex 1.

Welcome and introductions

7. Dr Charlie Weller, Head of Vaccines Programme, Wellcome Trust, opened the meeting with a warm welcome to consultation participants. She commended the meeting organizers for taking a holistic approach to meningitis and for incorporating country representation and patient voices in defining the roadmap.

8. Dr Jeremy Farrar, Director of Wellcome Trust, thanked the organisers of the meeting. He reflected on his own history in meningitis research and noted the importance of both addressing the major causes of meningitis as well as considering the needs of people affected by other pathogens. He stated that Wellcome Trust, the world’s second largest charity, is
committed to addressing infectious diseases, and offered to use their influence as well as their funding to combat meningitis.

**Personal story – Dianne Spalding**, ambassador, Meningitis Research Foundation

John Spalding, a physician, woke with a fever at 3 am on December 23, 2014. At 7 am, he asked his wife, Diane, to call his clinic and tell them he would be out sick that day. “I’ll be in later,” John said. He slept quietly all morning, but at 12:30, he asked her to call an ambulance and fell first into a delirium and then into respiratory failure. Diane and their son started resuscitation, but John died in their hands before the ambulance arrived. The sudden loss was devastating.

John died from a meningococcal strain that had made its way from South America to England. Because meningitis is difficult to distinguish from other illnesses and can progress rapidly, vaccines are the best way to prevent such tragedies. Since John’s death, Diane has found a new purpose as a “befriender” for others who have gone through a similar loss, and in raising awareness of meningitis. This work helps Diane find a positive meaning in her experience.

**Overview of the Roadmap**

9. The roadmap is a global strategy to defeat meningitis. Responding to the devastation of the disease, it sets out three **Visionary Goals**:  
   - Eliminate bacterial meningitis epidemics  
   - Reduce cases and deaths from vaccine-preventable bacterial meningitis  
   - Reduce disability and improve quality of life after meningitis due to any cause

10. It takes a holistic approach through five **Strategic Pillars**:  
    - Prevention and epidemic control  
    - Diagnosis and treatment  
    - Disease surveillance  
    - Support and care for people affected by meningitis  
    - Advocacy and engagement

11. Patient groups value all 5 pillars, but believe that prevention should be the highest priority because meningitis can be fatal within hours.

**Words used by patient groups to describe meningitis**

- Heart-breaking
- Frightening
- Dangerous
- Horrific
- Scary
- Devastating
- Terrifying
- Preventable
- Life-changing
- Deadly
- Avoidable
12. These five pillars define a practical and feasible strategy based on a rigorous situation analysis. For implementation, this strategy will be tailored to regional and national circumstances. Targets to be achieved by 2030 will be defined through scenario modelling and take a pragmatic approach. At this consultation, participants agreed with the pragmatic approach but called for the adoption of ambitious targets for the sake of the people affected.

13. Participants noted that the strategy must drive action and suggested engaging with country level partners and with related global and regional initiatives. Especially in low- and middle-income countries, it will be crucial to link with and improve primary health care services to enhance universal health coverage.

**Vaccines research, development, and access**

Multinational and developing country vaccine manufacturers addressed questions about the role of industry in defeating meningitis.

**What are the primary challenges for developing and manufacturing meningitis vaccines?**

14. Regulatory requirements and expectations differ across jurisdictions and evolve constantly, increasing the time and resources needed to make new vaccines available. WHO prequalification, which is essential for accessing global markets, presents complex additional requirements. These issues are especially challenging for developing country vaccine manufacturers with less experience serving global markets.

15. In order to supply affordable products, manufacturers must plan carefully and maximize efficiency. Most meningitis vaccines are complex to manufacture and require a minimum of three months to complete quality testing. Because of long production times, **long-term demand forecasts** are needed and manufacturers are not able to address spikes in demand.

16. Demand forecasts must be reliable. Vaccine prices are set based on manufacturing costs, which are closely linked with production volume. When predicted demand does not materialise, production volumes fall and economies of scale are lost, making the vaccine more costly to manufacture. As businesses, manufacturers have difficulties supplying products at the same price but at smaller volumes.

**What mechanisms and incentives are needed to foster development of meningitis vaccines that are affordable and accessible to all who need them?**

17. **Provide assurance of long-term demand.** Most vaccine manufacturers are for-profit companies. Assured demand, ideally through purchase volume commitments, is needed to justify investments in manufacturing capacity. This remains true even when research and development costs have been offset by donor funding.

18. Continue to **improve regulatory harmonization and vaccine prequalification.** Regional bodies such as the African Regulatory Harmonization Initiative and the African Vaccine Regulatory Forum are...
improving efficiency in vaccine regulation in Africa: similar efforts would be useful in other regions and globally. WHO is working towards a mutual recognition system for drugs that can also be applied to vaccines. The Developing Country Vaccine Manufacturers Network is also working to improve dialog between regulators and manufacturers.

19. **Use existing vaccines more widely.** To inform commercial and policy decision making, “full public health value propositions” are needed to show where currently available vaccines can play a valuable role. These should be global in perspective, since all populations are at risk of meningitis.

20. Along the same lines, systematic reviews of evidence and modelling research can inform policies, such as on the use of vaccines for serotype 1 pneumococcus to address pneumococcal meningitis outbreaks in Africa. Serious outbreaks have occurred, particularly in Ghana, and are likely to continue unless adequate vaccination policies are implemented to prevent disease in older children and adults.

21. Facilitate access for **middle-income countries**, which are lagging in introduction of new vaccines. Because middle-income countries offer greater profit-making potential than Gavi countries, manufacturers see them as an attractive market. Regulatory harmonization, assistance to achieve WHO prequalification, and pooled purchasing mechanisms can help manufacturers supply these countries. Consultation participants were divided on whether price transparency would improve affordability.

22. Additional ways to facilitate meningitis vaccine development include: improving the understanding of disease epidemiology across countries and age groups; clarifying product preferences; improving access to the intellectual property needed to develop high-volume, low-cost processes; establishing correlates of protection to simplify and speed product development; building clinical trial capacity in low- and middle-income countries; and providing funding for clinical studies large enough to detect rare adverse events and establish efficacy. Public-private partnerships can serve many of these needs and facilitate vaccine development.

**What can you commit to doing to achieve the goals of the roadmap?**

23. Vaccine manufacturers and the International Federation of Pharmaceutical Manufacturers and Associations are involved at all levels of vaccine research, development, regulation, and distribution, and will continue to contribute in these ways. They strongly support Gavi’s mission to increase the equitable use of vaccines in lower income countries. They are also an underutilized resource for education on vaccines and for support to countries, both pre- and post-introduction.

24. In addition to supplying the current meningitis vaccines, manufacturers are developing next generation vaccines. Availability of new, affordable multivalent meningococcal conjugate vaccines is anticipated for 2021. Likewise, pneumococcal conjugate vaccines that protect against additional serotypes and a novel vaccine against group B streptococcus are in development.

25. Participants asked about the potential to improve affordability by increasing regional manufacturing capacity. It has been difficult to build
vaccine manufacturing capacity, even fill/finish capacity, in the African region, and vaccine production remains concentrated in high-income countries and a few middle-income countries. Significant incentives would be required to promote this kind of capacity building.

26. Stakeholders explored the role of vaccine stockpiles in outbreak response. Stockpiled vaccines have been central to controlling meningococcal meningitis epidemics in sub-Saharan Africa and globally, but their use has been constrained by vaccine supply and affordability challenges. Participants noted that preventing outbreaks by vaccinating proactively is preferred over responding to outbreaks once they occur.

Diagnostic test research, development, and access

Experts shared progress in improving diagnostic methods.

27. In February 2018, a group of experts convened by WHO identified three high priority “use cases” for meningitis diagnostics.³

1) Use Case 1: Outbreak response in Africa. Enable peripheral health facilities in Africa to rapidly detect and differentiate meningococcal serogroups to inform patient care and reactive vaccination campaigns.

2) Use Case 2: Case management for treatment initiation. Enable frontline health workers worldwide to identify bacterial meningitis, thus informing antibiotic use and referral to higher level care.

3) Use Case 3: Case management to stop or switch treatment. Enable health facilities worldwide to detect and differentiate a panel of bacterial and viral pathogens causing syndromic meningoencephalitis, thus informing case management and surveillance.

28. Use Case 1: Currently, latex agglutination test kits are used to identify meningitis serogroups and inform reactive vaccination campaigns. These tests do not meet Use Case 1 because they do not detect all relevant serogroups and pathogens. In addition, they require refrigeration and have short shelf lives.

29. To address this use case, companies are developing rapid immunoassays for the detection of pneumococcus in urine and cerebrospinal fluid and for the detection of meningococcus serogroups A, C, W, Y, and X in cerebrospinal fluid. These tests are thermostable and have shown promising sensitivity and specificity in the laboratory and when evaluated by WHO under field conditions in Burkina Faso and Niger. For implementation, these tests will require quality-assured production and user training on interpretation and must be available in sufficient numbers and at affordable prices.

30. Use Case 2: Institut Pasteur is pursuing lipocalin 2 as a biomarker for acute bacterial meningitis. This protein is detected in cerebrospinal fluid from patients with acute bacterial meningitis, but not in samples from patients with acute viral meningitis. Diagnostic test development is underway, including production of “dipsticks” for testing with specimen panels and research using multiple biomarkers in combination.
31. **Use Case 3:** Currently, commercial polymerase chain reaction (PCR) tests with high sensitivity and specificity are being used to identify pathogens. These tests do not meet Use Case 3 because they are expensive and require sophisticated laboratory capacity. Diagnostic devices that can be used more widely are needed for case management and surveillance.

32. Multiple portable, real-time PCR platforms that can detect multiple targets in less than 2 hours could potentially address Use Case 3. In addition, innovative technologies, such as a system developed by Fiocruz that uses high resolution melting with intercurrent dye instead of expensive probes, have the potential to improve affordability of PCR methods.

33. To advance the use of these technologies in diagnosing meningitis, technical experts are preparing a target product profile for PCR-based meningitis diagnostics. They have also initiated discussions with PCR platform manufacturers.

34. Funding will be needed to enable development, field evaluation, and implementation of these tests. Test development should minimize costs and infrastructure requirements to maximize the sustainability of the test. Field evaluation should assess clinical utility in addition to performance attributes. Implementation strategies must include training and technical support for equipment.

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**Serving the most vulnerable – Anne von Gottberg,** Laboratory Lead of the Centre for Respiratory Diseases and Meningitis, National Institute for Communicable Diseases, South Africa

As clinical microbiologist in South Africa, Anne von Gottberg sees first-hand the inequities of meningitis. Two weeks ago, two infants died in day-care facilities in poor communities in Johannesburg. They were dropped off well in the morning and found dead just hours later, sparking fears of a meningitis outbreak. Despite the urgency of the situation, notification and investigation of these cases took over a week. In contrast, when a child in a kindergarten in an affluent suburb was unwell, the school principal notified health authorities before the illness was even diagnosed. This child had a mild enteroviral illness and recovered.

Inequities are everywhere: in all countries the poor, homeless, refugees, and people in prisons live in pockets of vulnerability and have no voice. Following this roadmap and doing what is pragmatic and good, innovating to reach the most vulnerable, and getting to as many children as possible will make a difference.

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**Note:** See Annex 1 for the discussion of Disease Surveillance.

**Disability and aftercare**

Disability rights experts and advocates led a discussion on ways to address the needs of individuals and families affected by meningitis.

35. Meningitis causes life-changing sequelae and impairments, particularly in cases due to the pneumococcus or group B streptococcus. Globally, 15% of all individuals who recover from meningitis suffer one or more impairments affecting everyday life. Among those who recover from pneumococcal or group B streptococcal meningitis, more than 30% suffer
long-term after-effects. The risk of severe after-effects is greater in countries with a high meningitis burden and in lower-income countries.

36. For children with severe impairments, including intellectual and neuromotor impairments, parents may assess the quality of life as “worse than death”. Education services, physical therapy and assistive technologies such as hearing aids and wheelchairs can make a huge difference.

37. These services and assistive technologies are often not available. In the UK, only half of families affected by meningitis felt that the child’s needs for aftercare were met, and one-fifth had difficulties accessing services. In low- and middle-income countries, only 5-15% of those who need assistive technologies have access. Barriers to access include costs, inadequate access to transportation, long waiting times, lack of awareness, and insufficient supplies of assistive devices.

38. Families everywhere need information about the sequelae of meningitis, living with disabilities and the rights of the people living with disabilities, and education on how to address stigma and discrimination. Grief and bereavement support are also required. They need greater access to economic and social opportunities to break the negative feedback cycle of disability and isolation and to improve their quality of life.

39. To address these needs, we must engage with communities. Ally with community leaders and traditional and faith healers to facilitate early detection of impairments and connect families to services. Build awareness in the general population to generate demand for services and address beliefs that create barriers to care-seeking.

40. Collaborate across the health sector. Include the after-effects of meningitis and the needs of families in the curricula of medical and public health schools. Train health workers to communicate about what to expect and how to access services. Emphasise the importance of assessing after-effects after discharge, and of long-term follow-up to detect impairments that present later in life, such as cognitive issues.

41. Take a multisectoral approach. Meningitis often causes multiple impairments, making integration of services especially important. Educators can help identify persons with after-effects of meningitis. Community rehabilitation should work in concert with health system. Non-profit organizations, civil society organizations, and charitable organizations can fill gaps and make a huge difference in meeting people’s needs.

42. Apply existing tools. Guidelines and training tools developed for high-income settings should be adapted and implemented more widely to help healthcare workers, families, and communities to identify and address needs.

43. Innovate. Affordable innovations such as cell phone apps can improve information for families, help them access local resources, and connect
advocates. Innovation can also improve assistive devices, such as solar-powered hearing aids.

44. **Mobilize political will and resources.** Where meningitis is not prioritized by governments, demand that it be addressed. Join up with disability action groups and draw on global initiatives such as the United Nations Convention on the Rights of Persons with Disabilities\(^6\) and the WHO Global Disability Action Plan 2014-2021\(^7\) to help address the lifelong consequences of meningitis.

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**Importance of disability – Hannah Kuper, Director International Centre for Evidence in Disability, London School of Hygiene and Tropical Medicine**

There are millions of people today with disabilities due to meningitis. Unlike Helen Keller, who lived an accomplished and successful life despite deaf-blindness, they are often excluded from society and livelihoods, more likely to lack healthcare and be among the poor, and face social stigma and sometimes violence. Prevention and healthcare have failed them, and they need support and aftercare. This will be true tomorrow and as we approach 2030: their needs will not disappear.

People with disabilities need better access to healthcare, including specialized rehabilitation. Breaking barriers to access by improving affordability, making buildings physically accessible, and training clinicians will make healthcare better for everybody. We also need to go beyond health systems to embrace education, livelihood and social support for those affected.

These are enormous needs, but they can be addressed. Successes, such as family support groups for children with cerebral palsy due to Zika virus infections, which are making a huge difference at relatively low cost, show it can be done.

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**Advocacy and funding strategy: keys to success**

Participants and experts explored the role of advocacy and community engagement in defeating meningitis.

**How do we generate political will for meningitis?**

45. The movement to defeat meningitis has grown rapidly over recent years. We have the tools, knowledge, and skills to go far today. To end unnecessary suffering from meningitis, we need **coordinated and effective advocacy to mobilize political will and funding to implement the roadmap**.

46. **Advocacy works.** Media campaigns and social mobilization in Australia in response to serogroup W meningococcal disease led to government support for a multivalent meningococcal vaccine. Advocacy for serogroup A meningococcal vaccination in Nigeria helped speed its implementation in routine immunization.

47. **To engage political leaders, combine information with persuasion.** Assess the impact of the disease, analyse the needs, and mobilize support through political channels. Make the most of opportunities such as World Meningitis Day\(^8\) and the International Day of Persons with Disabilities\(^9\) to engage with politicians. Advocate with ministers of health and finance to build the case for implementation. Build community support and educate the public through mass media such as radio. Invest in

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*“Although the world is full of suffering, it is also full of the ways of overcoming it.”* —Helen Keller

*“We are partners in the same fight, on the same road, in the same change.”*
advocates to reach remote communities. Use social media and partners such as civil society organisations to convey key messages, celebrate successes and recognize political action. Assemble parliamentary groups, which have been successful in building momentum for priority diseases in donor and high-burden countries alike. Learn from highly effective advocacy groups such as the HIV community.

48. **Tell personal stories.** Patients are credible advocates who command attention. Meningitis advocates such as Bebe Vió\(^\text{10}\), a world champion wheelchair fencer who competes using prosthetic arms, and Davide Morana\(^\text{11}\), who launched the hashtag, #ArribaLaVida, inform and inspire.

49. **Individuals can make a difference.** Lady Gaga is working with WHO to highlight global mental health issues. In Ireland, Laura Brennan helped to increase acceptance of Human Papillomavirus Vaccine (HPV), which prevents cervical cancer, before dying from the disease. In the US, Ethan Lindenberger is advocating for immunisation against the wishes of his mother who refused to vaccinate him as a child. We all have the power to reach out, without waiting for a roadmap.

**How can we make meningitis a funding priority?**

50. **Understand and address funder priorities.** Map stakeholders to identify and understand potential funders, including national health budgets and non-traditional funding sources such as public-private partnerships, corporate social responsibility investments, and in-kind investments. Many donors are becoming less interested in disease-specific initiatives with overly ambitious goals and prefer bottom-up community-based approaches. Countries such as Fiji are avoiding siloed approaches and driving for integration of existing systems.

51. For Gavi-eligible countries, align initiatives with the Gavi 5.0 priorities of **equity, integration, and targeted and tailored approaches.** Regarding multivalent meningococcal conjugate vaccines, pending policy recommendations, Gavi will consider carefully how to structure its support for strong uptake into routine programs. For example, support for preventive mass campaigns may be made available only when vaccines are available for both routine and campaign use.

52. **Build off existing initiatives,** such as the introduction of serogroup A meningococcal vaccine in Africa. Emphasize that the job is not done: out of 26 countries in the meningitis belt, fewer than half have introduced the vaccine into routine immunization to date. Delayed introduction of serogroup A vaccine could create pockets of susceptible individuals, leading to a risk of catastrophic resurgence of those epidemics.

53. **Promise both impact and value.** Show benefits in terms of return on investment as well as on lives saved. Relate the benefits of meningitis control to government goals, economic outcomes, education, equity, and the health security agenda. Include the after-effects of meningitis when calculating its burden: “Counting the Cost of Meningococcal Disease”\(^\text{12}\), an analysis of lifelong rehabilitation costs, was instrumental in decisions to implement meningococcal B vaccine in the UK.
54. **Create a sense of urgency.** New and emerging vaccines against the causes of meningitis present an opportunity to fundamentally change the landscape of meningitis control, and to benefit other health priorities by improving vaccination and surveillance.

55. **Integrate across health and broader issues.** In countries where meningitis is a rare event, it requires a holistic approach that spans issues. Form coalitions with related agendas such as Every Woman Every Child, World Pneumonia Day, and the disability rights agenda to come up with shared visions and workplans.

56. **Show progress.** Achieving milestones builds confidence and credibility, missed targets can support calls for additional effort.

57. **Coordinate communication.** A communication plan that defines critical activities, linkages, and roles and responsibilities is in place for the development and endorsement of the roadmap. This will be further developed for roadmap implementation.

58. **Craft clear and consistent messages.** We need a common set of messages and a shared dataset in order to speak with credibility, clarity, and power. This should include a handful of infographics, what we are asking for, and the WHO and major partners logos, which carry tremendous authority. These global resources should be translated widely.

59. **Spread the word.** Of consultation participants, a minority had taken part in World Meningitis Day activities. This session ended with a call for action among those assembled to spread the word about the roadmap and to use the #Meningitis2030 hashtag.

**Monitoring and evaluation (M&E)**

60. M&E will ensure that we remain on track to achieve the aims of the roadmap. A small team has developed an early draft M&E framework that reflects the three visionary goals of the roadmap and specific goals for each of the five strategic pillars. They have proposed indicators corresponding to these goals, aiming for an overall framework that will be feasible to implement. These indicators will be updated to reflect the outputs of this consultation.

61. The draft M&E framework proposes data sources, baseline values, interim milestones, and 2030 targets for each indicator. Many indicators, such as those for vaccine coverage and disease incidence, can be assessed through existing or proposed reporting mechanisms. Other indicators can be monitored by WHO or national focal points. Data on disabilities can be collected in conjunction with periodic health surveys. Qualitative indicators will require case studies or key informant interviews.

62. An M&E working group will finalize the M&E framework and develop the M&E plan. This plan will include M&E at the regional level, annual reviews, periodic external evaluations, and ongoing results dissemination. It should be ready for implementation in late 2020.
63. The Meningitis Progress Tracker\(^{14}\) consolidates meningitis-related data, estimates and stories; helps to share progress on the roadmap; and serves as an advocacy and educational tool. It displays the burden of meningitis and key data relating to each pillar of the roadmap, such as vaccine coverage and personal stories. Users can filter the data by pathogen, syndrome, and region, and focus on individual country profiles.

64. Consultation participants advised that the M&E framework monitor resources for implementing national meningitis action plans, access to affordable vaccines, and the establishment of vaccine stockpiles for outbreak response; and avoid setting targets that are outside our control. They also noted that omitting results from the M&E framework, such as access to specific vaccines, increases the risk that progress in those areas will not be measured and that those results will not come to pass.

**Implementation framework and next steps**

65. The roadmap is one of four flagship global strategies in the WHO General Programme of Work 2019-2023 to prevent and control high-threat infectious hazards. WHO is committed to driving its implementation in an agile, integrated way at all levels.

66. After this consultation, the roadmap was reviewed by the WHO Strategic Advisory Group of Experts on Immunization in October 2019 and finalized. The final roadmap will support the submission of a corresponding resolution to the World Health Assembly, through the WHO Executive Board in February 2020.

67. Strong links will be established with other initiatives and global strategies such as the Immunization Agenda 2030 (IA2030) to avoid duplication and ensure integration and coordination: these discussions have already begun and will be formalized in early 2020.

68. WHO will also invite highly committed global sponsors to form a Strategy Support Group. Proposed initial members include the African Union, the Bill & Melinda Gates Foundation, the UK Department for International Development (DfID), Gavi, the United States Agency for International Development, and the Wellcome Trust. This group should be launched in 2020 and will be expanded as the strategy unfolds.
69. A Technical Taskforce meeting in early 2020 will discuss partner roles and responsibilities, regional representation, support for developing the implementation framework, and stakeholder engagement.

70. Global implementation of the roadmap will begin in 2020 with:
- Developing a business plan to support resource mobilization
- Formulating public health value propositions as needed
- Finalizing the M&E plan and establishing an independent M&E Committee
- Finalizing and implementing the communication plan

71. For implementation at the regional and country levels, the global strategy will be adapted through consultations with country representatives and regional bodies into Regional Implementation Frameworks that include:
- Definition of activities and priority countries
- Integration with primary health care and universal health coverage
- Links and synergies with other initiatives
- Needs for technical assistance, monitoring, and supervision
- Human and financial resource mobilisation at the national level
- Regional M&E plans

“All power to your elbow, because it’s such an important agenda.”

**UK Perspective – Chris Whitty**, Chief Scientific Advisor, Department of Health and Social Care, UK

The UK shows what is possible in a high-income country that puts huge resources against meningitis. We have a good vaccination program and have been an early adopter of meningitis vaccines. With a very good surveillance system, we can see the effect of these vaccines. We are also home to major investors in meningitis and there is tremendous support for meningitis control, largely due to advocacy by patient groups.

Impact has been slower in other settings: we need to make the case that these are serious diseases which are seriously preventable at small risk. The UK is committed to international development and to vaccines more generally. It is hosting next Gavi replenishment and would like to do anything they can to support the meningitis roadmap.
Conclusions

72. **Dr Mike Ryan**, Executive Director of the WHO Health Emergencies Programme, recognized the contributions of the meeting participants and thanked DfID and the Wellcome Trust for their visionary leadership.

73. He emphasized that meningitis is the single disease mothers fear most, noting that it induces similar panic in every country and that most countries have gone through a meningitis crisis. He called for innovation and merging the specificities of meningitis with integrated, universal access to essential health services at the community level.

74. He called on all stakeholders to work together in an agile and integrated way, highlighting that the greatest need lies in countries that are extremely vulnerable due to poor governance, political instability, active conflict and climate change. These countries have the highest incidence of meningitis and systems that are incapable of delivering the services their people need.

75. Dr Ryan committed WHO to driving, facilitating, and coordinating roadmap implementation, in collaboration with DfID, the Wellcome Trust, and the assembled stakeholders.

76. **Dr Jo Mulligan**, Senior Health Advisor for the UK Department for International Development, noted that DfID has been a long-term supporter of meningitis vaccine development. It is proud of its contributions to global successes against meningitis, including in supporting countries, together with WHO and partners, in immunization of more than 350 million people in Africa against serogroup A meningococcus. DfID is eagerly awaiting results on the multivalent vaccine in development by a PATH led public-private partnership.

77. She highlighted the importance of strong partnerships across governments, product developers, funders, WHO, and implementing agencies, and praised the product development partnership model for harnessing the best of each sector.

78. Dr Mulligan confirmed that DfID will continue to support progress against meningitis. In addition to vaccine development, which is an important part of DfID’s product portfolio, they are looking for other ways to help, including cost-benefit studies and other research to inform decisions at a country and global level.

79. **Dr Toa Fakakovikaetau**, Community Paediatrician of the Ministry of Health, Kingdom of Tonga, thanked the meeting participants, noting that she will advocate for the roadmap in her ministry, and is looking forward to progress in access to vaccines, diagnostics, surveillance, and aftercare. As a small country, Tonga depends on others to drive development issues, and she thanked her African colleagues for raising the issue of meningitis to a global level.

80. Dr Fakakovikaetau closed the consultation by declaring, “**Meningitis is not a regional problem, it’s a global problem. Together we will win.”**
Acknowledgments

The development of the roadmap has been financially supported by the Bill & Melinda Gates Foundation. This consultation was funded by the UK Department for International Development and the Wellcome Trust.

Annexes

- Group Work on Strategic Pillars
- Meeting Agenda
- Participant List

1 A global vision for meningitis by 2030 and an action plan to get there: https://www.wiltonpark.org.uk/wp-content/uploads/WP1521-Report.pdf
3 Meningitis Diagnostics Use Cases. https://www.who.int/emergencies/diseases/mentingitis/mentingitis-diagnostics-use-cases.pdf
5 WHO Rehabilitation 2030 and associated resources: https://www.who.int/rehabilitation/en/
8 World Meningitis Day 2019 http://www.comomeningitis.org/world-meningitis-day/
13 Approaches include Demographic Health Surveys and Multiple Indicator Cluster Surveys.
14 Meningitis Progress Tracker-Key data and meningitis estimates: https://www.meningitis.org/mentingitis/mentingitis-progress-tracker
Defeating Meningitis by 2030
Global Roadmap Stakeholder Consultation – Group Work

Monday 16 September – Wednesday 18 September 2019

Hosted by the Wellcome Trust, London, UK

In focused discussion groups, consultation participants identified quick wins, priorities, challenges and enablers for each strategic pillar. They addressed specific questions and proposed refinements to activities and milestones.

**Pillar 1 – Prevention and epidemic control**

*Achieved through development of and enhanced access to affordable vaccines, effective prophylactic measures and targeted control interventions*

1. **Quick wins**
   - Introduction of meningococcal serogroup A vaccines into routine immunization programs in at least 18 meningitis belt countries by 2021, and at least 20 countries by 2023.
   - By 2022, completing global introduction of *Haemophilus influenzae* type b vaccination.
   - By 2022, at least one affordable multivalent (ACWXY) meningococcal conjugate vaccine licensed and WHO-prequalified.

2. **Other activities and milestones providing most impact**
   - By 2025, pneumococcal conjugate vaccines introduced in all countries with locally relevant strategies.
   - By 2026, at least one affordable vaccine against Group B streptococcus licensed and WHO-prequalified for maternal immunization during pregnancy.
   - By 2020 at least one, and by 2025 at least three, additional affordable PCVs with coverage consistent with emerging data on serotypes causing invasive disease in LMICs, licensed and WHO prequalified.
   - By 2030, recommended prevention policies implemented in medium/high burden countries as defined in the group B streptococcus strategy, unless superseded by a vaccination program.

3. **Additional activities suggested by participants**
   - Conduct studies to build evidence for use of pneumococcal conjugate vaccines to prevent serotype 1 pneumococcal meningitis.
   - Define a research agenda for the roadmap to facilitate resource mobilization.

4. **Challenges and enablers**
   - Non-Gavi middle-income countries lag in vaccine introduction. Collective bargaining approaches such as those used in the Americas could facilitate access.
   - Some countries in the meningitis belt are deferring introduction of meningococcal A vaccine in their routine immunization programs until the 5-valent vaccine is available. Emphasising the need for regional elimination of serogroup A and continuing to address misconceptions around the risk of serogroup A outbreaks and multivalent meningococcal vaccine availability could help motivate introduction of the monovalent vaccine.
   - New vaccines must overcome regulatory challenges, will require clear evidence of public health value to encourage implementation, and consolidated demand forecasts. Applying the WHO template for value propositions to additional vaccines and working with countries to assess demand can help address these challenges.
• Low-income countries need more evidence on the benefits of group B streptococcus prevention approaches, including consideration of non-vaccine prevention such as passive immunization with monoclonal antibodies and maternal azithromycin treatment. Targeted research can fill this evidence gap.

5. Additional discussion points
• Consider the benefits of multi-antigen campaigns and strategies.
• Ensure that all syndromes addressed by meningitis vaccines are represented in the value proposition to motivate vaccine development and introduction.
• Look beyond the meningitis belt and consider what is needed to defeat meningitis globally.

**Pillar 2 – Diagnosis and treatment**
Achieved through access to appropriate diagnostic assays at all levels of healthcare, health worker training, and prompt and effective treatment

1. Top priorities
• Diagnostic assays that identify the main pathogens of suspected meningitis cases.
• Comprehensive, regionally adapted patient management guidance and treatment guidelines for all causes of meningitis at all ages.

2. Other activities and milestones providing most impact
• Increase timely collection and testing of diagnostic lumbar punctures, blood and other specimens.
• Ensure appropriate training and supervision at each level of care on timely identification, diagnosis, referral and treatment of meningitis.
• Research to identify diagnostic assays that can support immediate medical decision making at or near point of care.

3. Additional activities suggested by participants
• Developing practical guidance on how to make tests available at country level (going from test development to validation, licensing, procurement, distribution, etc).

4. Challenges and enablers
• Diagnostic tests must meet regulatory requirements and will require funding for development, implementation, training, and supervision to ensure quality of testing and increase collection of clinical specimens. Overcoming these challenges will require advocacy, demand creation, funding mechanisms, innovative regulatory strategies, country-specific implementation strategies, and knowledge sharing.
• Guidelines for treatment and patient management must overcome sparse and poor-quality evidence and serve the needs of divergent stakeholders and settings. Assembling the existing guidelines, conducting targeted research, and involving patient groups, the Meningitis Research Foundation, and ministries of health can help achieve this milestone.

5. Additional discussion points
• Milestones include a) quality assured, affordable and accessible rapid diagnostic assay developed based on a specific biomarker to rapidly detect invasive bacterial vs viral infection by 2026 and b) test deployed in 50 LMICs by 2030. These targets are very ambitious from a technical perspective but also not ambitious enough in terms of the need to combat drug resistance driven by overuse of antibiotics.
• More emphasis should be placed on ensuring diagnostic tests meet the needs in the field and are accessible, feasible, useful, and targeted/validated for the intended population and use case.
**Pillar 3 – Disease surveillance**

Achieved by surveillance of all main causes of bacterial meningitis and their sequelae to guide meningitis control policies and accurately monitor progress toward goals

1. **Quick wins**
   - By 2022, regional surveillance guidance available in all regions for main meningitis pathogens.
   - In collaboration with the WHO collaborating centres and reference laboratories, establish a global genome network for meningitis pathogens.
   - Perform global surveillance of emerging resistance patterns of main pathogens, linking with antimicrobial resistance networks and control strategies.

2. **Other activities and milestones providing most impact**
   - By 2022, international and regional guidelines for surveillance of group B streptococcus disease developed for all regions.
   - Proposed new milestone: by 2025 establish governance and guidelines for sharing of strains and associated data, access and use of strains.

3. **Challenges and enablers**
   - Surveillance guidelines need to factor in differences in existing surveillance priorities, systems and capacities and will require funding and coordination for implementation. Taking a systems approach and building on synergies can facilitate this effort.
   - The global genome network will need to bring together multiple existing databases and obtain representative samples from regions and countries. Regional guidance in conjunction with the roadmap and active curation can help address these needs.

4. **Additional discussion points**
   - Improving surveillance requires strengthening diagnosis, as discussed for Pillar 2.
   - The after-effects of meningitis can be monitored through periodic surveys rather than ongoing surveillance.

**Pillar 4 – Support and care for people affected by meningitis**

Achieved by ensuring that effective systems for timely identification and management of sequelae are implemented and that people and families/carers affected by meningitis can access appropriate support and care services that meet their needs

1. **Priorities**
   - Research on epidemiology and impact of sequelae: better data to understand demand/need for services and inform their design and provision.
   - Best practice guidance for detection, monitoring and management of sequelae.
   - Service mapping.
   - Up to date information on services provided to patients and caregivers.

2. **Challenges and enablers**
   - Data on the sequelae and impairments due to meningitis are sparse and often use differing language and concepts. Standardising language, using specific examples from communities, and starting in high-capacity countries can help address these gaps.
   - Guidelines for support and care will require significant adaptation to national circumstances and resources for implementation. Progress monitoring will also require significant resources. Involving schools and communities in providing and monitoring services, encouraging advocacy groups to promote accountability, and tracking progress at a global level can help ensure implementation.
Annex 1

**Group Work on Strategic Pillars**

- Mapping of services should be led by countries with support of WHO and include information on how to access services. Directories of services, both government-provided and private, should be made available to all those who make referrals.

3. **Additional discussion points**
   - We can focus specifically on people affected by meningitis as long as we pay attention to, contribute to, and coordinate with broader disability initiatives.
   - This pillar must be ambitious because this is a very neglected area. Most member states have already committed to improving these areas through their signatures to the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and the roadmap should contribute to holding states to account.

**Pillar 5 – Advocacy and engagement**

*To raise public and political awareness of meningitis, its impact, and potential to result in disability, in order to improve health-seeking and access to control measures*

1. **Quick wins**
   - By 2020, global meningitis dashboard developed and updated regularly to show burden of meningitis, its impact and global roadmap progress.
   - By 2020, a business investment case available and promoted at global, regional and national level, that includes plans to monitor and evaluate roadmap progress. Should focus on the additional efforts needed and the incremental benefits, not the total need.
   - By 2022, ≥80% of priority countries have undertaken a baseline needs assessment of meningitis and its impact.

2. **Other activities and milestones providing most impact**
   - By 2021, meningitis and related impact included in all relevant strategic and operational plans and budgets of WHO (Global and Regional), development organizations, and donors with plans to monitor progress.
   - By 2021, communications and engagement strategy developed that defines key audiences, messages, channels, drivers and barriers for policy change from a country perspective.
   - By 2022, World Meningitis Day and related global health dates visibly endorsed by global policy makers/funders and used by ≥80% of countries to assess/promote roadmap progress and share learning through personal stories and best practice around the world.
   - By 2023, meningitis awareness campaigns conducted in ≥80% of countries appropriate to national burden and integrated with existing health awareness activities.
   - By 2023, risk and communication plans addressing vaccine hesitancy and promoting vaccine confidence developed, integrated into national plans, and implemented in >50% of countries; and by 2026, implemented in >80% of countries.
   - By 2024, ≥80% of countries have a context appropriate meningitis action plan and monitoring framework aligned to their national health strategy, budget and global roadmap through to 2030.
   - By 2025, region specific research published on community understanding of the risk of meningitis and the factors that facilitate or act as barriers to health seeking behaviours for meningitis.
   - By 2025, awareness raised on International Day of Persons with Disabilities in ≥80% of countries to increase sensitization of communities on disability and awareness of available support and specialist services.
   - By 2025, citizen representation and input to national meningitis annual plans in ≥30% of countries.
Annex 1

Group Work on Strategic Pillars

- By 2025, research conducted and by 2028 (depending on vaccine availability) group B streptococcus maternal vaccination promoted.
- By 2028, recommended actions included in national plans in >80% of countries.

3. Challenges and enablers
- Global meningitis dashboard: lack of data and poor data quality, especially for group B streptococcus, make it difficult to show the burden of meningitis. Existing data should be consolidated and additional data should be collected under Pillar 3.
- Business investment case: estimating the incremental costs and benefits of the roadmap will be challenging, especially for non-vaccine interventions. Learning from existing business cases for health systems strengthening and leveraging relevant expertise can facilitate development.
- Action plans: near term target dates are seen as aggressive, given planning cycles and the time needed to align stakeholders; longer term targets are seen as conservative, coming too close to the end of the decade. The group suggested revisiting the target dates.
- Advocacy activities: clarification is needed on the purpose and approach for advocacy activities; funding will be needed for their implementation. Making use of existing campaigns and movements can help overcome these challenges.

4. Additional discussion points
- All of the milestones were considered high priority by the group.
- An additional milestone should be established for resource mobilisation as a follow up on the business case.
- In several instances, participants suggested focusing milestones on the performance of "priority countries" where this strategy would have the greatest impact. Prioritization criteria have not yet been established. Prioritisation factors should include disease burden, not simply country income.
- Advocacy supports all pillars of the roadmap and needs to serve multiple issues and reach multiple audiences. Messaging and priorities will differ depending on the audience.
- Gather lessons learned from other initiatives, including what we should not do. Look outside public health for examples of successful behaviour change and use of social media.
- Advocacy for investing in prevention can help create demand for vaccines and encourage manufacturers to invest in product development and manufacturing capacity.
Defeating Meningitis by 2030 Global Roadmap

Monday 16 – Wednesday 18 September 2019

A stakeholder consultation

Context

Meningitis is a highly feared disease around the world with a high case fatality, serious after-effects and a propensity to cause epidemics. There were an estimated 300,000 deaths from meningitis in 2015, with deaths from meningitis and sepsis in children under 5 being estimated as similar in number to deaths from malaria. Meningitis and sepsis cause serious after-effects such as hearing loss, visual impairment, brain damage and limb loss that have a considerable emotional, social and financial impact on individuals, families and communities. Epidemics of meningitis present a major challenge for health systems, the economy and society. Meningitis is a largely vaccine-preventable disease, but progress in defeating meningitis lags behind other vaccine preventable diseases.

In May 2017, over 50 representatives from governments, global health organizations, public health bodies, academia, private sector, and civil society called for a global vision to “defeat meningitis by 2030”. In September of that year, 200 representatives from the 26 countries of the African meningitis belt amplified this call and highlighted the need for equitable and sustainable access to meningitis vaccines.

The World Health Organization (WHO) has coordinated the response to this call to action. A Technical Taskforce of major technical partners historically invested in long-term meningitis control, particularly in the African region, with complementary focus and expertise, was convened to develop a global roadmap. After conducting a Baseline Situation Analysis, the draft roadmap was further developed in February 2019 by experts in meningitis, health and disability to set the stage for engaging with a wider group of stakeholders.

A global fight against meningitis is fully aligned with WHO’s new 13th General Programme of Work and captures the essence of the WHO three-fold mission: promoting health, keeping the world safe, and serving the vulnerable.

Finalizing the roadmap

This meeting is designed as a large stakeholder consultation to develop the final draft of the roadmap to defeating meningitis by 2030, and to ensure that the roadmap is aligned with the perspectives of countries and that people affected by meningitis have a voice.

This consultation will serve as an open forum for engaging a wide range of multidisciplinary experts and members of civil society, from the public and private sector and all regions of the world. The objectives of the meeting are to:

- Finalize the roadmap;
- Identify priority activities, enablers and challenges in implementation;
- Discuss a framework for strategy implementation.

Format

There will be a mix of keynote speakers, plenary sessions, panel discussions and breakout groups. Presentations and discussion will be in English.

Overall Rapporteur: Angela Hwang.

Working Group Rapporteurs: Natacha Blake, Chloe Day, Lucy McNamara, Liz Rodgers, and Claire Wright.
Monday 16 September  
*Chair: Brian Greenwood, LSHTM*

13.30 **Registration and Lunch**

14.20 – 14.40 **1. Welcome and introductions**
- Meeting opening: Charlie Weller, Wellcome Trust
- Testimonies of families with experience of meningitis: Diane Spalding, ambassador for Meningitis Research Foundation

14.40 – 15.25 **2. Overview of the roadmap – Plenary**
- Overview: Marie-Pierre Preziosi, WHO
- Pending Questions: James Stuart, WHO
- Discussion

15.25 – 17.10 **3. Roadmap priorities – Group Work**
Each group (5 groups) will be tasked to review one pillar, i.e. to systematically:
- Address pending questions
- Prioritize activities and milestones
- Identify early impact drivers

17.15 **Day 1 meeting close**
Address from Jeremy Farrar, Wellcome Trust

17.30 **Drinks**

18.30 **Dinner**
Keynote address: Anne von Gottberg, National Health Laboratory Service, South Africa
Tuesday 17 September

Morning chair: Ziad Memish, Ministry of Health, Kingdom of Saudi Arabia

08.45 – 9.30  **Main outcomes from Day 1 Group Work – Plenary**
One rapporteur from each group

9.30 – 10.30  **4. Vaccines R&D and access – Panel**
Moderator: Ray Borrow, Public Health England
Panel members: Jamie Findlow (Pfizer Inc.), Brad Gessner (International Federation of Pharmaceutical Manufacturers & Associations), Suresh Jadhav (Serum Institute of India, Pvt., Ltd.), Neal Xiao (Walvax Biotechnology Co. Ltd.)

10.30 – 11.00  **Tea and coffee**

11.00 – 12.00  **5. Diagnostic tests R&D and access – Panel**
Moderator: Olivier Ronveaux, WHO
- Introduction to the three use cases – Olivier Ronveaux, WHO
- Identification of a biomarker for meningitis – Muhammed-Kheir Taha, Institut Pasteur de Paris
- Meningitis multiplex test: current situation, progresses and challenges – Xin Wang, US-Centers for Disease Control and Prevention

Additional panel members: Rangarajan Sampath (Foundation for Innovative New Diagnostics), Robert Heyderman (University College London)

12.00 – 13.00  **6. Disability and aftercare – Panel**
Moderator: Tarun Dua, WHO
Panel members: Action Amos (African Disability Alliance), Lisa D’Cruz (Meningitis Centre Australia), Linda Glennie (Meningitis Research Foundation), Nora Groce (University College London)

13.00 – 14.00  **Lunch**

Afternoon Chair: Priscilla Ibekwe, Nigeria Centre for Disease Control

14.00 – 15.15  **7. Monitoring and Evaluation – Plenary**
- A M&E framework for the roadmap – Lucy McNamara, US Centers for Disease Control and Prevention
- Meningitis Progress Tracker – Claire Wright, Meningitis Research Foundation
- Discussion
8. Priorities and way forward – Group Work

Each group (5 groups) will be tasked to review one pillar, i.e. to:

- Refine priority activities and milestones;
- Based on priority activities and milestones, identify enablers and challenges for their implementation;
- Consider cross-pillar aspects and link with other initiatives to achieve the identified priorities and overcome the challenges.

17.30

Day 2 meeting close

Drinks

18.30

Dinner

Keynote addresses:

- Chris Whitty, Department of Health and Social Care, UK
- Hannah Kuper, London School of Hygiene and Tropical Medicine
# Wednesday 18 September

*Chair: Toa Fakakovikaetau, Ministry of Health, Kingdom of Tonga*

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<td>09.00 – 10.15</td>
<td><strong>Main outcomes from Day 2 Group Work – Plenary</strong></td>
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<td><strong>9. Advocacy and funding strategy: keys to success – Panel</strong></td>
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<td>Panel members: Hayatee Hasan (WHO), Myriam Henkens (Médecins Sans Frontières), Elena Moya (Asociacion Espanola Meningitis), Imran Mirza (UNICEF), Omorodion Rhoda Omoile (Care and Development Centre), Zeenat Patel (Gavi, the Vaccine Alliance), Lois Privor-Dumm (International Vaccine Access Center, Johns Hopkins Bloomberg School of Public Health)</td>
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