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ASIA-PACIFIC DENGUE STRATEGIC PLAN (2008-2015)

The Asia-Pacific Dengue Strategic Plan (2008-2015) has been prepared by the WHO Regional Offices for South-East Asia and the Western Pacific to respond to the increasing threat from dengue, which is spreading to new geographical areas in Member countries of the South-East Asia and the Western Pacific regions. The development of this strategic plan is important to meet the requirements of the International Health Regulations (IHR) 2005. The goal is to reverse the rising trend of dengue in Member countries of both regions.

The strategic plan has been developed through consultation with programme managers during the biregional Dengue Programme Managers, meetings held in Phuket, Thailand in September 2007 and Singapore in May 2008. It will be used as guidelines for the development of national strategic plans by Member countries of both regions.

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Executive summary

The Asia-Pacific Dengue Strategic Plan (2008-2015) has been prepared in response to the increasing threat from dengue, which is spreading to new geographical areas and causing high mortality during the early phase of the outbreaks. Among an estimated 2.5 billion people at risk globally, about 1.8 billion (more than 70%) reside in the Asia-Pacific region. The development of this Strategic Plan is also important to meet the requirements of the International Health Regulations (IHR) 2005. The goal is to reverse the rising trend of dengue in countries of the Asia-Pacific region.

Countries of the region vary in terms of their preparedness, their capacity to respond and in the allocation of financial resources in the prevention and control of dengue. The Strategic Plan provides generic recommendations to allow local adaptation of strategies.

Dengue does not respect international boundaries. Effective dengue control is not possible if control efforts are limited to one country or a few. It requires the adoption of a regional approach through collaboration between countries and sustained partnerships to enable countries to implement evidence-based interventions and the use of best practices.

The Asia-Pacific Strategic Plan would assist countries to enhance their preparedness; enable them to promptly detect, characterize and contain outbreaks; and limit epidemics of dengue for effective prevention and control. This plan should be implemented in harmony with the Strategic Framework for Asia-Pacific Partnership for Dengue Prevention and Control (APDP).

The Strategic Plan should be used for elaborating national operational plans; to develop capacity and strengthen the health system; establish networking; harmonize itself with the APDP Strategic Framework for mobilization of resources and sustain ongoing information exchange; and be able to advocate for prevention and control of dengue. It would also assist in increasing access to innovations such as with tools for the diagnosis, prevention and treatment of dengue.

Introduction

1. Dengue is the fastest emerging arboviral infection. The maximum burden is borne by countries of the Asia-Pacific region. Among an estimated 2.5 billion people at risk globally, about 1.8 billion (more than 70%) reside in countries of the Asia-Pacific region. Its epidemiology is evolving rapidly, with increased frequency of outbreaks and expansion to new geographical areas that were previously unaffected. The mortality is highest during the initial period of the outbreak/epidemic.

2. The progressive worsening of dengue in the Asia-Pacific region is attributed to unplanned urban development, poor water storage and unsatisfactory sanitary conditions. It is an integral part of urbanization because of the creation of breeding habitats. It is a domesticated species that breeds in artificial containers. The high population density of the vector increases the opportunities for transmission of dengue.

3. The occurrence of dengue in one country is a threat to other countries and the spread of dengue intensified due to proliferating trade and travel. Therefore, dengue cannot be controlled if efforts are limited to one country above. Hence, a strong case should be made for the adoption of a biregional approach for the control of dengue in the Asia-Pacific region.

4. The present dengue control programmes in the Asia-Pacific region have inadequate resources, and the capacity of the health system to respond is limited. However, several countries have had favourable experiences in Asia-Pacific and Latin American countries. Some of these include Singapore, Thailand, Malaysia and Cuba. There is clearly a need for development of new diagnostic, preventive and therapeutic tools although the interventions that are currently available are known to be effective for more than two decades. The available tools should be used wisely and widely since the cost of procrastination will be very high.

Guiding principles

5. The Strategic Plan underpins several guiding principles intended for the formulation, implementation and evaluation of activities in the prevention and control of dengue.

- The Strategic Plan supports collaboration, cooperation and biregional solidarity for effective and sustained prevention and control of dengue in countries of the Asia-Pacific region.
- The Strategic Plan is designed that the prevention and control of dengue can be implemented using the existing policy framework of countries within the available infrastructure as an integral part of the programme for control of vector-borne

diseases, and integrated disease surveillance within the umbrella of basic health services.

- It is proposed to support country activities through national, multi-country, biregional and global partnerships. This Strategic Plan will be harmonized with the Asia-Pacific Dengue Partnership.
- The Dengue Prevention and Control Programme will use evidence-based interventions and will be implemented by employing the best practices.
- Networking will be developed to optimize the use of available resources. The national programme will be designed to build on the achievements of Member countries.
- Intersectoral and interprogrammatic collaboration will be the thrust of the strategy to maximize the provision of integrated services. Linkages will be developed with the Asia-Pacific Surveillance for Emerging Diseases (APSED) to strengthen the health system for surveillance and to contribute to the implementation of the International Health Regulations (IHR). This would require finding a niche for interventions that would reverse or halt the rising trend of dengue.
- The Strategic Plan promotes the adoption of evidence-based interventions that are currently available. At the same time, the plan recognizes the need for the development of a vaccine, improved diagnostics and drugs for the prevention and treatment of dengue and other innovations.

Constraints, opportunities and lessons learnt

6. Dengue is the fastest-growing arbovirus infection with a rapidly evolving epidemiology. It is listed among the 40 emerging diseases of global importance. The increasing burden of dengue in the Asia-Pacific region is a matter of serious concern since the disease is spreading to new geographical areas and the mortality rates are high in the early stages of the epidemic.

7. Dengue epidemics are an indication of the failure of the public health system to respond rapidly. Timely control of epidemics requires preparedness and capacity to undertake suitable and effective control activities during the inter-epidemic period. Resolution of an epidemic requires sustained high-level government commitment, strengthening of the public health infrastructure, intersectoral collaboration and community participation.

8. Until recently, the disease was predominantly urban. Consequently, dengue outbreaks receive considerable adverse publicity and coverage in the media (both in the case of real epidemics or rumours). This impacts negatively on tourism and industry and inflicts heavy economic losses to the country affected by the disease.

9. Resources for dengue control programmes are inadequate. The biggest challenge in the prevention and control of dengue is to mobilize additional resources to be able to implement interventions that have been demonstrated to be effective for more than two decades. Currently the allocation of funds for larval control and source reduction through community participation is very low, though this approach has been proved to be effective.

10. There is no specific treatment for dengue/dengue haemorrhagic fever (DHF). Antiviral drugs currently available are not effective for their prevention or treatment. No vaccine exists for the prevention of dengue. Resources are required to enhance capacity, intensify research to develop vaccine and improve diagnostic tools as well as specific treatment. WHO and international partners should advocate the need for resources.

11. Dengue is an ecological disease. It requires multisectoral action for its prevention and control. Therefore, it must be everyone's concern. Despite the worsening of the dengue situation, it has remained a neglected public health disease.

12. Although considerable progress has been made in source reduction with community and intersectoral partnerships and there are many instances of effective dengue prevention through community mobilization, these interventions have not been implemented widely for a perceptible national impact. Intercountry cooperation is required for a palpable impact in the Asia-Pacific region.

13. Evidence is available to prove that the case fatality rates can be reduced to less than 1% and even further if cases of DHF are admitted early and treated appropriately with standard treatment. This is possible when standard treatment is provided in large and small hospitals. This would require an increase in the capacity for standard case management of Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS).

Rationale for the strategy on prevention and control of dengue fever/DHF

14. The emergence of dengue, its rapidly evolving epidemiology and the economic losses resulting from the disease makes a compelling case for accelerating prevention and control efforts. The disease has attracted considerable media attention and received adverse publicity in recent years. Besides causing ill-health and excess mortality, it has also affected socioeconomic development due to loss of mandays and productivity.

15. The national programmes need to implement healthy public policy in development projects in urban and rural areas. Currently the national programmes have allocated meagre resources on dengue control; and a major part of the expense is incurred on insecticide sprays and chemical larviciding, which have had little impact on controlling the epidemic. In contrast, evidence shows that vector control through larval monitoring, source reduction

and personal protection, combined with a good sanitary environment in households and communities has proven to be effective in preventing dengue.

16. Community participation and social mobilization for behaviour modification have begun to show good results in many different settings. Investing in this approach and in integrated vector management (IVM) will produce the desired results.

17. Dengue prevention and control should be everyone's concern. The role of national policies is to strengthen the response to dengue within the health sector, facilitate intra programmatic collaboration and effectively mobilize intersectoral collaboration.

18. The strategy is aimed at utilizing optimally the currently available interventions based on evidence and, at the same time, advocating for intensification of research in the development of a suitable vaccine, antiviral drugs and appropriate diagnostics for dengue.

Regional goal, vision, mission and objectives

19. This Asia-Pacific Dengue Strategic Plan is part of the overall regional goal to reduce the disease burden due to major parasitic and vector-borne diseases to such an extent that they are no longer major public health problems.

20. The vision of the Asia-Pacific Strategy for Dengue is to minimize the health, economic and social impact of the disease by reversing the rising trend of dengue.

21. The mission is to enhance the capacity in countries and the Region through partnerships so that evidence-based interventions can be applied in a sustainable manner through better planning, prediction and early detection, characterization and prompt control and containment of outbreaks and epidemics.

Objectives

22. The objectives, purpose and expected results are proposed in the Strategic Plan to enable countries to achieve the regional goal and realize the mission and vision of dengue prevention and control. Different countries will achieve these objectives and expected results in the context of their current capacities and policies.

General objective

23. To reduce incidence rates of dengue fever and dengue haemorrhagic fever.

Specific objectives

- (1) To increase the capacity of Member countries to monitor trends and reduce dengue transmission.

- (2) To strengthen capacity to implement effective integrated vector management.
- (3) To increase health workers' capacity to diagnose and treat patients and improve health-seeking behaviour of communities.
- (4) To promote collaboration among affected communities, national health agencies and major stakeholders to implement dengue programmes for behavioural change.
- (5) To increase capacity to predict, detect early and respond to dengue outbreaks.
- (6) To address programmatic issues and gaps that require new or improved tools for effective dengue prevention and control.

24. For each objective, expected results, activities and key indicators have been identified using the logframe approach. This is included in the annexure.

Components of the strategy

- (1) Dengue surveillance
- (2) Integrated vector management
- (3) Case management
- (4) Social mobilization
- (5) Outbreak response communication
- (6) Research

Supportive strategies

25. Dengue outbreaks and epidemics are a reflection of the failure of the public health system in the country. Dengue is a disease that comes into focus during an epidemic and the interest on it as well as the commitment to combat it declines after the epidemic is brought under control. Many of the affected countries do not also have a national programme for its eradication. Its control requires a high level of sustained government and public commitment, strengthening of the public health infrastructure, intersectoral and intercountry collaboration and community mobilization.

26. A number of supportive strategies are needed for effective implementation of the Asia-Pacific Dengue Strategic Plan (2008-2015).

Mobilization of resources

27. Despite the growing threat of dengue, resources for the control of dengue have not increased. The magnitude of national and international support continues to fall far short of the needs. There are untapped resources at national, regional and global levels. To mobilize

additional resources, synchronized action is needed with the support from partners and different stakeholders. The Asia-Pacific Dengue Partnership (APDP) can play an important role in advocacy and help in mobilization of required resources. To do this, it is necessary to synchronize the strategy with the APDP. Countries need to prepare operational plans that include the identification of funding gaps. An advocacy plan should be prepared and implemented for mobilizing the resources required on a sustained basis. Asia-Pacific Dengue Partnerships should be engaged in advocacy for mobilization of additional resources for the prevention and control of dengue.

28. Dengue control programmes in countries should be implemented as an integral part of the national policies. The dengue control programmes have to find a niche and visibility within the existing disease surveillance programmes, including the development of links with IHR and the vector-borne disease control programme. It has to be a part of basic health services and be able to find a place within the scope of decentralization policies in the national programme.

Partnerships

29. The Asia-Pacific Dengue Partnership (APDP) for Dengue Prevention and Control was formed in March 2006. A strategic framework has been prepared by a core group comprising national representatives and partners. It is proposed to harmonize the Asia-Pacific Dengue Strategic Plan with the APDP. The Regional Strategic Plan recognizes that partnerships for the prevention and control of dengue are required to mobilize additional resources and enhance collaboration between countries. Sustained partnerships are crucial for showcasing the cause of dengue prevention and control through advocacy.

Programme planning and management

30. Effective programme management necessitates the preparation of an operational plan that identifies the resources committed and the resource gaps. The capacity of staff at different levels – national, subnational and district – in programme planning and management has to be increased. Human resource development is a key component of capacity development. The development of capacity for the prevention and control of dengue is not an isolated effort but an integral part of strengthening the entire health system for more effective control of vector-borne diseases, disease surveillance including IHR and the provisioning of basic health services. Capacity development is to be undertaken on the basis of training needs, the institutional environment and national policy. Since different countries in the Asia-Pacific region have different health systems and policies, the Dengue Prevention and Control Programme has to be consistent with the national situation. The Asia-Pacific Dengue Strategic Plan should be used by countries to evaluate the best options for use in their operational plans.

31. Even within a decentralized or an integrated framework it is necessary to identify the specific needs of dengue prevention and control so that control measures have adequate visibility. These include increased laboratory capacity, standard case management of dengue and vector surveillance. Programme planning and management also include developing a system for procurement, logistics and effective supply management. The health management information system and revamped surveillance are crucial in the context of dengue control since the disease often strikes in the form of outbreaks and epidemics.

Monitoring and evaluation

32. A monitoring and evaluation framework is necessary to track the progress of implementation of the operational plan. Monitoring should be result-based and the framework should include outcome and output indicators that are easily quantifiable and can be verified. The indicators are included in the log frame (see annexure).

Implementation of the Strategic Plan

33. The Asia-Pacific Dengue Strategic Plan was discussed in the intercountry programme managers' meeting held in September 2007 in Phuket, Thailand. In November 2007 the Regional Adviser from WPRO, Coordinator/CDC, SEARO, TDR fellow and a consultant refined the plan and the log frame while taking into consideration the deliberations during the meeting and the recommendations arising from the group work during the programme managers' meeting. The revised strategy document will be shared with national programmes in countries of the SEA Region. The revised strategy will also be discussed at a programme managers' meeting of countries of the Western Pacific Region of WHO before being approved by the Regional Committee for the Western Pacific in 2008.

34. A roadmap would be required for the implementation of the strategy. The first step after establishing a coordination mechanism will be to assist countries in preparing operational plans indicating the budgeted amounts and their source of funding, as well as the resource gaps. Political, technical and managerial expertise in countries would be mobilized for increasing the capacity to implement operational plans. To implement the Strategy it would be necessary to harness the expertise available in countries through collaboration and networking. Technical guidance should be provided by the Asia-Pacific Technical Advisory Group. Regular reviews of the programme will be conducted and efforts made to encourage research and innovation in the development of innovations in the development of diagnostics, drugs and vaccine for the prevention and control of dengue in the Asia-Pacific region.

Annex

The Log Frame Dengue Strategic Plan

Component I: Dengue surveillance

Planning elements	Indicators	Verification source	Assumptions and risks
Regional goal			
To reduce the disease burden due to major parasitic and vector-borne diseases to such an extent that they are no longer major public health problems			
Regional objective			
To reduce incidence rates of dengue fever and dengue haemorrhagic fever	<ul style="list-style-type: none"> The rising trend in dengue is to be stemmed between 2008-2010 in comparison with 2005-2007 The regional average reported incidence rate reduced by at least 20% (2010-2012 average versus 2005-2007) The regional average reported incidence rate reduced by at least 20% (2013-2015 average versus 2010-2012) Impact of outbreak mitigated¹ 	<p>Regular WHO updates</p> <p>Dengue outbreak response report</p>	<p>Political commitment</p> <p>Funds</p> <p>Human resources coordination and surveillance systems in place</p>
Purpose			
To increase capacity of Member States to monitor trends and reduce dengue transmission	<ul style="list-style-type: none"> Number of Member States with surveillance system in place and reporting to WHO monthly Number of Member States with national surveillance policy statements consistent with the new IHR commitments Number of Member States with resource commitment in place for dengue programme-based on surveillance data Number of Member States 	<p>Member States' monthly reports</p> <p>National policy statements</p> <p>National plans and budgets</p> <p>Surveillance</p>	<p>Political commitment</p> <p>Funds</p> <p>Interest and capacity of stakeholders to participate</p>

¹ Measured by morbidity and mortality rates, number of cases, geographical containment and duration of outbreak

	<p>whose interventions are based on surveillance data.</p> <ul style="list-style-type: none"> • Number of Member States able to report cases within 48 hours from health facility to programme level 	<p>reports</p> <p>Guidelines on outbreak response</p>	
Planning elements	Indicators	Verification source	Assumptions and risks
Expected Results			
1. Existing standard dengue case definition adopted	<ul style="list-style-type: none"> • Number of Member States using the standard case definition based on WHO guidelines • Number of Member States where DF/DHF is made notifiable 	<p>Policies on the use of standard case definition</p> <p>National Plans and standard operating procedures</p> <p>National Policy</p> <p>National legislation</p>	<p>Policies are applied by Member States</p>
2. Laboratory surveillance strengthened	<ul style="list-style-type: none"> • Number of Member States with at least one laboratory able to serologically confirm dengue diagnosis, carry out serotyping and virus isolation procedures • Number of Member States with laboratories upgraded for improved surveillance (note: needs to be defined) • Number of Member States with reference laboratories providing quality control/ quality assurance services • Number of regional reference laboratories providing quality control/ quality assurance services • Number of Member States with laboratories participating in regional QC/QA networks • Number of integrated laboratory networks established in the Asia- Pacific region 	<p>External evaluation reports (from WHO and peer reviewers)</p> <p>Cross-checking reports</p> <p>Network reports</p>	<p>Official acceptance of quality control mechanism</p> <p>Availability of sensitive tests</p> <p>Human and financial resources</p>
3. Regional dengue information system developed	<ul style="list-style-type: none"> • System in place and functioning with information on trends and updated situation analysis • Regional website operational 	<p>Regional database</p> <p>Data on website</p>	<p>Political commitment</p> <p>Human resources</p> <p>Timely availability of personnel assigned</p> <p>Human and financial</p>

			resources
4. Mechanisms for sharing timely and accurate data strengthened	<ul style="list-style-type: none"> Number of Member States reporting validated information (i.e. data on case incidence and case fatality rate (CFR)) for working intervals (to be defined: monthly or weeks, or?) timely (to be defined) Note: different intervals may apply for case incidence and CFR Shared information system in place Number of Member States that sign agreement to provide data into a shared surveillance system Number of Member States whose monthly data of the previous quarter is accessible from the regional website (dengue information system) 	<p>Member States' monthly reports and agreements</p> <p>Website and/or DengueNet signed agreement</p> <p>Data on website</p>	<p>Political commitment (Member States' willingness to share their data)</p> <p>Human resources</p> <p>User-friendly information system in place</p>
5. Regional/inter-country response to timely advisory and resource (personnel, financial, stockpiling) mobilization improved	<ul style="list-style-type: none"> Number of Member States that act upon advisory Inter-country high-level discussions for coordinated response to dengue situation within the framework of IHR Number of Member countries reporting to WHO Regional Office and HQ as per IHR 	<p>Advisories and reports on action taken</p> <p>Meeting reports</p> <p>Country reports</p>	<p>Political commitment</p> <p>Funds</p> <p>Human resources</p>
6. Incorporate dengue surveillance (case, vector and seroprevalence) into an integrated and strengthened disease surveillance system	<ul style="list-style-type: none"> Number of countries reporting dengue via the Integrated Diseases Surveillance Programme (IDSP) Number of countries where dengue surveillance and vector surveillance are integrated 	<p>Country reports</p> <p>Programme review (e.g. programme managers' meetings, external reviews)</p>	<p>Political commitment</p> <p>Funds</p> <p>Human resources</p>
7. Monitoring Member States' surveillance systems	<ul style="list-style-type: none"> Number of countries subject to internal yearly monitoring and external monitoring every three years 	<p>Monitoring reports</p>	<p>Political commitment</p> <p>Funds</p> <p>Human resources</p>

Activities	Outputs	Responsible	Resources and time frame
Expected Result 1:			
Existing standard dengue (DF/DHF) case definition adopted and case fatality rate standardized			
1.1 Circulate standard case definition to	<ul style="list-style-type: none"> Standard case definition 	Programme	Funds (e.g. during regional programme)

Activities	Outputs	Responsible	Resources and time frame
Member States	packaged and distributed	managers WHO	managers' meetings) Quarter 4 of 2008
1.2 Add DF and DHF on notifiable diseases list	<ul style="list-style-type: none"> Legislation adopted: DF and DHF notifiable diseases in all member countries in the two regions 	MoH	Starting 2009
1.3 Circulate standard case fatality rate criteria to Member States	<ul style="list-style-type: none"> Standard CFR distributed and adopted 	Programme Manager WHO	Funds Quarter 4 of 2008
1.4 Conduct internal discussions in countries to promote standard case definition	<ul style="list-style-type: none"> Agreements and discussion proceedings 	WHO surveillance authorities	Funds Documenter Quarter 1 of 2009
1.5 Organize consultation with Member States for consensus	<ul style="list-style-type: none"> Consensus reached during managers' meeting Note: Meeting needs to take place during first quarter of 2009 	WHO Programme Managers	Funds Quarter 1 of 2009
1.6 Provide technical assistance for Member States to put in place the standard definition	<ul style="list-style-type: none"> ToR and list of qualified consultants. Appointment of consultant and dissemination of consultants' report 	WHO Member States	Funds Expert Quarter 1 of 2009
1.7 Support training for personnel where necessary	<ul style="list-style-type: none"> Training results and reports 	WHO regional offices WHO country offices	Funds Experts Partners Quarters 2 to 4 of 2009
Expected Result 2:			
Laboratory surveillance strengthened			
2.1 Develop evaluation criteria, assess/map out current status and identify gaps in existing laboratories	<ul style="list-style-type: none"> Inventory of laboratories and testing available Assessment results and reports 	Programme managers Laboratory managers WHO	Political commitment Funds Experts Quarter 4 of 2008 to quarter 1 of 2009
2.2 Develop standards for all laboratories including quality assurance	<ul style="list-style-type: none"> Laboratory standards and quality assurance procedures produced and disseminated to Member States. List of reference laboratories that meet standards 	WPRO and SEARO Regional Reference Laboratory	Funds Experts Regional reference laboratory services Quarter four of 2008 to quarter 1 of 2009
2.3 Integrate dengue	<ul style="list-style-type: none"> Laboratories at all levels have 	MoH and related	Funds for monitoring and

Activities	Outputs	Responsible	Resources and time frame
into existing national/regional laboratory network and ensure that the network is functional	dengue serological confirmation and or typing integrated into surveillance and routine reporting <ul style="list-style-type: none"> • Functional (coordination and communication) laboratory network in place 	agencies WHO	supervision Experts 2009 to 2015
2.4 Monitor laboratory performance once a year	<ul style="list-style-type: none"> • Performance reports from assessments • Plans for quality improvement 	Programme managers Laboratory managers WHO regional offices WHO country offices	Funds Human resources Experts 2009 to 2015
2.5 Set up one national reference laboratory for virus isolation and characterization or integrate into existing emerging/ re-emerging diseases reference laboratory	<ul style="list-style-type: none"> • Reference laboratory in place with the capacity for virus isolation and characterization and seroprevalence 	MoH WHO regional offices; WHO country offices Partners	Funds Human resources Experts 2010 +
2.6 Designate regional reference laboratory, at least one in each region and enhance country collaboration	<ul style="list-style-type: none"> • Regional reference laboratory, at least one in each region 	WHO regional offices Partners	Funds Experts 2009
2.7 Enhance laboratory capacity through training and human resource development	<ul style="list-style-type: none"> • Training courses for laboratory personnel conducted • Training guidelines developed 	MoH National and Regional reference laboratories WHO Partners	Funds Experts 2009 to 2015
Expected Result 3: Regional dengue information system developed			
3.1 Agree on a dengue information system and designate national focal points	<ul style="list-style-type: none"> • System defined • Focal points available 	MoH WHO	Political commitment Funds Quarter 1 of 2009
3.2 Produce and disseminate	<ul style="list-style-type: none"> • Manual of Operation 	WHO Programme	Funds for training Expert

Activities	Outputs	Responsible	Resources and time frame
guidelines.		Managers	Functional system Quarter 2 of 2009
3.3 Develop and pilot-test the information system at different levels within the health sector	<ul style="list-style-type: none"> • Functional system • Reports of Member States' experiences during pilot test • Evaluation and enhancement of system 	WHO Programme Managers	Funds for pilot test Expert Functional system Quarter 3 of 2009 to quarter 4 of 2010
3.4 Support training on information system	<ul style="list-style-type: none"> • Training results and reports 	WHO Programme Managers	Funds for training Expert Facilitator Functional system 2011 +
3.5 Implementation and use of the system.	<ul style="list-style-type: none"> • Reports of Member States feeding/accessing data from the system 	Programme Managers	Human and financial resources 2011 +
3.6 Monitor performance of the system and implement corrective action as needed	<ul style="list-style-type: none"> • Sustained use of the information system verified through monitoring reports 	WHO Programme Managers	Human resources and financial resources 2011 +
<p>Expected Result 4: Mechanisms for sharing timely and accurate data strengthened</p>			
4.1 Conduct mapping exercise of existing mechanisms including information on how they function.	<ul style="list-style-type: none"> • Inventory report of existing mechanisms for subnational, national and regional sharing of data. 	Programme managers WHO MoH	Funds Human resources 2009
4.2 Establish system for reporting timely (to be defined) and accurate data within countries, in the regions and between the two regions	<ul style="list-style-type: none"> • Memorandum of Understanding between WHO and MoH • Reporting system in place • Focal person in each Member State and at the subnational level 	MoH WHO regional offices WHO country offices	Funds Expert 2009
4.3 Support workshops to train on timely reporting of accurate data.	<ul style="list-style-type: none"> • Training results and report. 	MoH Officers in VBDCTS responsible for dengue data WHO	Funds for training Experts 2009 to 2010

Activities	Outputs	Responsible	Resources and time frame
4.4 Conduct monitoring and assessments of the reporting system.	<ul style="list-style-type: none"> • Reports by programmes/reference laboratories to assess compliance with agreed-upon standards 	Programme managers Reference laboratories	Political commitment Funds Experts 2011 +
Expected Result 5: Regional/inter-country response to timely advisory and resource (personnel, financial, stockpiling) mobilization improved			
5.1 Use the mechanisms established to exchange information within the IHR framework	<ul style="list-style-type: none"> • Protocol for intercountry response • List of contact persons • Regular information-sharing between the two regions 	WHO regional offices WHO Country Offices Partners	Political commitment (all levels) 2010
5.2 Conduct orientation and briefing of WHO WRs	<ul style="list-style-type: none"> • Mission reports 	WHO regional offices WHO country offices	Funds 2009
5.3 Mobilize financial resources, personnel and stockpiles	<ul style="list-style-type: none"> • Funds, human resources available. • Stockpiles defined, purchased and maintained 	WHO country offices WPRO and SEARO	Focal points at regional and country offices 2009 and on
Expected Result 6: Incorporate dengue surveillance (case, vector and seroprevalence) into an integrated and strengthened disease surveillance system			
6.1 Identify strengths and weaknesses of existing national diseases surveillance systems through mapping and desk review	<ul style="list-style-type: none"> • SWOT analysis 	MoH WHO	Political commitment Funds Expert 2009
6.2 Initiate activities to address weaknesses.	<ul style="list-style-type: none"> • Strengthened national diseases surveillance system. 	MoH WHO	Political commitment Funds Expert 2010 +
6.3 Operationalize and integrate dengue surveillance with the national disease surveillance system in accordance with IHR	<ul style="list-style-type: none"> • Integrated surveillance plan/framework • Testing operationalization of integrated plan at all levels 	MoH WHO	Political commitment Funds Experts 2010 +

Activities	Outputs	Responsible	Resources and time frame
6.4 Enhance surveillance capacity through training and feedback	<ul style="list-style-type: none"> • Training programmes • Impact assessment of training programmes 	MoH WHO Partners	Political commitment Funds Experts Ongoing
Expected Result 7: Monitoring member state dengue surveillance systems			
7.1 Conduct external situation analysis of existing surveillance systems	<ul style="list-style-type: none"> • Monitoring reports 	MoH WHO	Political commitment Funds Expert Every three years starting in 2010
7.2 Internal review of existing surveillance systems	<ul style="list-style-type: none"> • Monitoring reports 	MoH	Political commitment Funds Expert Yearly starting in 2010

Component II: Integrated Vector Management

Planning elements	Indicators	Verification source	Assumptions and risks
Regional goal			
To reduce the disease burden due to major parasitic and vector-borne diseases to such an extent that they are no longer major public health problems			
Regional objective			
To reduce incidence rates of dengue fever and dengue haemorrhagic fever	<ul style="list-style-type: none"> The rising trend in dengue stemmed between 2008-2010 relative to 2005-2007 Regional average reported incidence rate reduced by at least 20% (2010-2012 average versus 2005-2007) Regional average reported incidence rate reduced by at least 20% (2013-2015 average versus 2010-2012) Impact of outbreak mitigated² 	Regular WHO updates Dengue outbreak response report	Political commitment Funds Human Resources Coordination and surveillance systems in place
Purpose			
To strengthen the capacity to implement effective integrated vector management	<ul style="list-style-type: none"> Number of Member states with vector control policies implemented 	National Policy Statements Programme reports	Political commitment Funds
Expected Results			
8. Vectors fully described and vector indicators regularly monitored.	<ul style="list-style-type: none"> Number of Member States monitoring and reporting Reports of identified vector key containers/habits Records of changes in vector populations Number of Member States reporting reduced vector population 	Annual reports Vector surveillance reports	Availability of qualified vector surveillance team Funds
9. Regional IVM Strategy developed	<ul style="list-style-type: none"> Regional IVM Strategy produced and disseminated 	Regional strategy	Political commitment Funds
10. Evidence-based	<ul style="list-style-type: none"> Number of Member States 	National policy	Political commitment

² Measured by morbidity and mortality rates, number of cases, geographical containment, and duration of outbreak

Planning elements	Indicators	Verification source	Assumptions and risks
strategies to control vector populations adopted according to IVM principles	<p>that have adopted IVM strategy and guidelines as an integral component of their dengue national plan</p> <ul style="list-style-type: none"> • Number of countries which have adopted healthy public policy • Number of Member States with regulatory mechanisms in place in relation to environment and pesticide management • Number of partners/sectors participating and contributing to vector control 	<p>statements</p> <p>Regulatory mechanisms</p> <p>Plans of key sectors/ agencies integrating vector control</p>	<p>Funds</p> <p>Availability of qualified vector surveillance team</p>
11. Member State-level IVM strategy and guidelines developed consistent with regional strategy	<ul style="list-style-type: none"> • Number of Member States with IVM implementation plan • Number of Member States adhering to the Regional IVM implementation guidelines 	<p>National plan with IVM component</p> <p>Implementation guidelines</p>	<p>Political commitment of MoH and other sectors</p>
12. Capacity to implement IVM including training and recruitment of entomologists strengthened	<ul style="list-style-type: none"> • Number of Member States implementing IVM for control of dengue • Number of Member States with non-health-related staff trained on IVM • Number of Member States with trained entomologists supporting IVM activities • Number of Member States with trained personnel at national and subnational levels implementing IVM activities (i.e. changes in water management, changes in architectural design, environmental modification, solid waste management) 	<p>Training reports</p> <p>Progress reports on national plan implementation</p>	<p>Political commitment</p> <p>Interest of agencies and public sector</p> <p>Staff motivation and incentives</p>
13. Mechanisms to facilitate community involvement for vector control established ³	<ul style="list-style-type: none"> • Number of Member States with organized community-based groups planning and implementing vector control activities 	<p>Survey reports to identify groups</p>	<p>Staff motivation and incentives</p>
14. Rational use of insecticides for vector	<ul style="list-style-type: none"> • Number of Member States with policies/guidelines on 	<p>Reports from regulatory agencies</p>	<p>Political commitment</p>

³ community involvement in vector control elaborated in Component IV: Social mobilization and communication for dengue.

Planning elements	Indicators	Verification source	Assumptions and risks
control promoted	rationale use of insecticides based on WHOPES guideline for insecticides • Number of Member States that enforce guidelines	Annual reports	Local expertise
15. Vector resistance monitoring strengthened	• Number of Member States that have established a vector resistance monitoring system	Monitoring results	Funds Local Expertise

Activities	Outputs	Responsible	Resources
Expected Result 8: Vectors fully described and vector indicators regularly monitored			
8.1 Analyse and review current vector surveillance activities and availability of baseline data	<ul style="list-style-type: none"> Baseline data on vector distribution, ecology abundance and seasonal trends gathered for one year 	MoH WHO-collaborating centres (data to be gathered from other available sources if necessary)	Funds Expert (Timeline by end 2009)
8.2 Develop vector surveillance plan at national level (lower levels if needed)	<ul style="list-style-type: none"> Vector surveillance plan to include: stratified areas at risk identified for intervention (district, provincial levels); frequency and coverage of surveys 	MOH with support of WHO Country focal point	MoH commitment Funds Expert
8.3 Develop a training manual and guidelines on vector surveillance	<ul style="list-style-type: none"> Training needs assessment in terms of available resources and target groups Training manual on vector surveillance disseminated 	MoH WHO	Funds Expert
8.4 Training on vector surveillance methods including data analysis and reporting	<ul style="list-style-type: none"> Training results and reports Training of trainers and refresher courses to be considered 	MoH WHO	Funds Experts
Expected Result 9: Regional IVM strategy developed			
9.1 Develop guidelines for situation analysis and needs assessment on IVM	<ul style="list-style-type: none"> Guidelines developed and disseminated 	WHO regional office	Funds Experts (2008-09)
9.2 Conduct meetings with programme managers to finalize the regional IVM strategic plan 9.3 Establish IVM inter-sectoral task force to develop the national IVM strategy	<ul style="list-style-type: none"> Agreements recorded in minutes of meetings Regional and national strategy Financial proposal outlining needs for potential funding 	WHO regional office WHO country office MoH Partners	Funds
Expected Result 10: Evidence-based strategies to control vector populations adopted according to IVM principles			
10.1 To organize workshops on GIS or basic mapping	<ul style="list-style-type: none"> Develop risk maps at appropriate levels 	MoH	Funds Technical support (timeline 2009 -2010)

Activities	Outputs	Responsible	Resources
methods			
10.2 Develop vector control plan/ strategy based on mapping	<ul style="list-style-type: none"> Vector control strategy developed based on risk mapping 	MoH WHO Partners	Funds Expert
10.3 Conduct periodic re-mapping (to be linked to periodic surveillance 8.1)	<ul style="list-style-type: none"> Vector maps periodically updated 	MoH WHO Partners	Funds Expert Collaborating centres for vector control
10.4 Carry out vector control trials/pilot test for evidence-based IVM approach at local levels	<ul style="list-style-type: none"> Documented evidence-based strategies with appropriate indicators 	MoH Research and collaborating centres in collaboration with other agencies (e.g. GEF/UNEP)	Funding for pilot Expert
Expected Result 11:			
Member State adopt or develop IVM strategy and guidelines consistent with regional strategy			
11.1 Disseminate regional IVM strategy among programme staff	<ul style="list-style-type: none"> National plans which incorporate IVM 	Programme Manager WHO regional office WHO country office	Funds Human resources (Timeline 2009)
11.2 Conduct internal discussion and analysis within programmes to encourage adoption and integration into national plans	<ul style="list-style-type: none"> Agreements recorded in minutes 	Programme Manager WHO regional office WHO country office	Funds Expert
11.3 Identify and select IVM taskforce and draft strategy.	<ul style="list-style-type: none"> National IVM Strategy 	MoH WHO	Funds Expert
11.4 Obtain political support for strategy	<ul style="list-style-type: none"> Political commitment from national government 	Prime Minister or President's office MoH Programme Manager Chair- National IVM Development Taskforce	Effective advocacy like Melanesian Spearhead group; ASEAN heads of Government etc.
11.5 Mobilize inter-sectoral support for IVM	<ul style="list-style-type: none"> Intersectoral collaboration (including public and private sector) 	MoH WHO Partners	Effective advocacy among other sectors Funds
Expected Result 12:			
Capacity to implement IVM including training and recruitment of entomologists strengthened			
12.1 To assess the national need for entomologists and regional training centres for	<ul style="list-style-type: none"> Entomologist need assessment Regional training to address needs of countries 	MoH or Ministry of Environment	Funds (timeline 2009-2010)

Activities	Outputs	Responsible	Resources
entomologists' training			
12.2 Mapping of entomologists or other qualified technical support at the regional level including vector control personnel)	<ul style="list-style-type: none"> List of personnel working as entomologists and on vector control 	Programme managers	Funds Expert
12.3 Training of entomologists and vector control personnel on IVM	<ul style="list-style-type: none"> Entomologists and vector control personnel trained on IVM Training results and reports Integrated training to include entomology 	WHO HQ WHO regional office WHO country office	Funds Expert
Expected Result 13:			
Mechanisms to facilitate community involvement for vector control established⁴			
13.1 Conduct assessment of Member States that have organized community-based groups	<ul style="list-style-type: none"> Assessment results and reports. Inventory of available advocacy resources for community awareness in Member States 	Programme Managers WHO Partners Urbani school kit	Funds Expert (timeline 2009)
Committee to be setup to provide Technical support on social mobilization	<ul style="list-style-type: none"> Taskforce set up. Country could establish its own Task Force 	MoH WHO	Resources
13.2 Disseminate and conduct advocacy based on results of assessment	<ul style="list-style-type: none"> Document/website/report on good practices Advocacy of political leaders 	WHO Programme managers	Political will Funds
13.3 Develop orientation modules on community involvement for VC	<ul style="list-style-type: none"> Modules available for various target groups Contents to be target group specific 	WHO regional office WHO country office Partners	Funds Experts
13.4 Conduct orientation among Member States on the developed modules	<ul style="list-style-type: none"> Orientation workshop agendas and reports for community groups 	Programme managers Community leaders Civil society	Funds Expert
Expected Result 14:			
Rationale use of insecticides for vector control promoted			
14.1 Draft legal framework for	<ul style="list-style-type: none"> Develop draft legislation 	MoA, MoH, MoEnv Focal point on	Intersectoral coordination

⁴ Community involvement in vector control elaborated in Component IV: Social mobilization and communication for dengue

Activities	Outputs	Responsible	Resources
judicious use of chemical insecticides.		Stockholm Convention etc.	
14.2 Provide WHOPES guidelines on pesticide management to Member States	<ul style="list-style-type: none"> • Recommendations during regional programme managers' meeting • National policy on rational use of insecticides according to WHOPES guidelines • Member States' guidelines adapted from WHOPES • Annual reporting of insecticide use 	WHO MoH	Political will Funds
Expected Result 15: Vector resistance monitoring strengthened			
To provide regional training on vector resistance monitoring	<ul style="list-style-type: none"> • Regional training conducted 	WHO	Funds
15.1 Identify monitoring sites for insecticide resistance and collect baseline data	<ul style="list-style-type: none"> • Maps showing current levels of resistance to insecticides in use: species, insecticide, location 	National Vector-Borne Disease control Programme (VBDCP)	Political will. Funds for field collection, laboratory testing, compiling and reporting data
15.2 Collection of data in monitoring sites at 2-3 year intervals	<ul style="list-style-type: none"> • Updated maps showing recorded changes in effectiveness of insecticides 	National VBDCP WHO	Political will. Funds for field collection, laboratory testing, compiling and reporting data
15.3 Use data to change national policy	<ul style="list-style-type: none"> • Change policy on purchase and use of insecticides based on results of resistance tests 	MoH (Mo Environment) WHO Partners	Funds Political will
15.4 Develop guidelines and train personnel on use of new insecticides	<ul style="list-style-type: none"> • New guidelines issued Training results and reports 	National VBDCP Regulatory procurement authorities WHO	Funds for new guidelines and training

Component III: Case management

Planning elements	Indicators	Verification source	Assumptions and risks
Regional Goal			
To reduce the disease burden due to major parasitic and vector-borne diseases to such an extent that they are no longer major public health problems			
Regional objective			
To reduce incidence rates of dengue fever and dengue haemorrhagic fever	<ul style="list-style-type: none"> • The rising trend in dengue stemmed between 2008-2010 relative to 2005-2007 • Regional average reported incidence rate reduced by at least 20% (2010-2012 average versus 2005-2007) • Regional average reported incidence rate reduced by at least 20% (2013-2015 average versus 2010-2012) • Impact of outbreak mitigated⁵ 	<p>Regular WHO updates</p> <p>Dengue outbreak response report</p>	<p>Political commitment</p> <p>Funds</p> <p>Human Resources</p> <p>Coordination and surveillance systems in place</p>
Purpose			
To increase health workers' capacity to diagnose and treat patients and improve health seeking behaviour of communities	<ul style="list-style-type: none"> • Case Fatality Rate (CFR) • Number of patients who seek consultation in health facilities within 48 hours at onset of fever • As early notification as possible 	<p>Surveillance reports (day of illness at time of notification)</p> <p>Death records</p> <p>Community-based survey results⁶</p>	<p>Political commitment</p> <p>Funds</p> <p>Definition of case and CFR standardized</p> <p>Deaths are properly recorded</p>
Expected Results			
16. Public awareness increased on warning signs and actions to be taken for dengue	<ul style="list-style-type: none"> • Proportion of target population able to identify key warning symptoms and take appropriate action 	<p>Comparative analysis of KAP/COMBI survey results (pre- and post-)</p>	<p>Funds</p> <p>Facilitators</p> <p>Willingness of communities</p>
17. Strengthen capacity of health-care providers to diagnose, treat or refer cases	<ul style="list-style-type: none"> • Number of health facilities per country that have standard training guidelines • Number of Member States with health workers trained 	<p>Follow-up/ observation/monitoring reports</p> <p>Health facility records</p>	<p>Funds</p> <p>Facilitators</p> <p>Interest and willingness of health</p>

⁵ Measured by morbidity and mortality rates, number of cases, geographical containment, and duration of outbreak.

⁶ Community-based surveys shall be conducted in conjunction with KAP surveys under Component IV: Social mobilization and communication for dengue.

Planning elements	Indicators	Verification source	Assumptions and risks
	<ul style="list-style-type: none"> on case management Number of Member States with health workers who apply standard case management Proportion of health facilities with at least one trained health professional Number of Member countries that have a functional clinical management committee Per cent of Member States' health care facilities with reorganized services for patient care Number of Member States with a functional blood bank 	<ul style="list-style-type: none"> Survey of facilities Standards for case management Listing of available blood banks 	<ul style="list-style-type: none"> facilities Cases are properly recorded
18. Laboratory support for case management improved	<ul style="list-style-type: none"> Number of health facilities/laboratories per Member States capable of performing laboratory clinical tests (i.e. CBC, at the very least a micro-haematocrit and microscope for platelet count) 	<ul style="list-style-type: none"> Health facility records Survey of facilities MoH records Laboratory records 	<ul style="list-style-type: none"> Funds Willingness of hospital authorities Available equipment Competent personnel
19. Referral network system in public and private sectors established	<ul style="list-style-type: none"> Number of Member States with a functional patient referral system 	<ul style="list-style-type: none"> MoH report External review 	<ul style="list-style-type: none"> Funds Expert

Activities	Outputs	Responsible	Resources
Expected Result 16:			
Public awareness increased on warning signs and actions to be taken for dengue.			
16.1 Conduct KAP ⁷ and investigate constraints to early health-care seeking	<ul style="list-style-type: none"> KAP survey results 	MoH	<ul style="list-style-type: none"> Political commitment Funds Human resources (Q1, 2009)

⁷ Knowledge, Attitude, Practices (KAP) Survey will be conducted in conjunction with Component IV: Social mobilization and communication for dengue

Activities	Outputs	Responsible	Resources
by the communities			
16.2 Develop and implement COMBI approach	<ul style="list-style-type: none"> Improvement in KAP as against baseline 	COMBI resource group ⁸ Partners	Funds Human resources (Q3, 2009-Q1, 2010)
16.3 Assess the impact of COMBI strategy on behavioural change	<ul style="list-style-type: none"> COMBI impact assessment 	COMBI Resource group ⁹	Funds Experts (six months after implementation)
16.4 Evaluation of sustainability of COMBI strategy	<ul style="list-style-type: none"> Monitoring and evaluation report 	COMBI Resource group	Funds Experts (12 months after implementation)
Expected Result 17:			
Capacity of health professionals strengthened to diagnose, treat or refer cases			
17.1 Set up a core group (clinical management committee) composed of public and private sector and other stakeholders	<ul style="list-style-type: none"> ToR and workplan: (Clinical Management Committee) 	MoH WHO Partners	Funds Political commitment (ASAP, latest Q4, 2008)
17.2 Conduct situation analysis – map capacity levels of public and private health professionals	<ul style="list-style-type: none"> Assessment results and reports¹⁰ 	MoH WHO Clinical Management Committee Partners	Expert Funds (Q1, 2009)
17.3 Develop training programmes and guidelines for different target groups	<ul style="list-style-type: none"> Training programmes, modules with guidelines and content areas 	MoH WHO Clinical Management Committee	Expert Funds (Q1, 2009)
17.4 Conduct training for various target groups, starting with priority areas	<ul style="list-style-type: none"> Training results and reports 	MoH WHO Partners	Expert (Q2-4, 2009) Funds
17.5 Monitor implementation of training and health care management capacity	<ul style="list-style-type: none"> Monitoring reports showing extent to which targeted facilities adhere to guidelines Targeted facilities with effective system in place 	MoH WHO clinical management committee	Experts Funds (Q3, 2010)
17.6 Monitoring the management and	<ul style="list-style-type: none"> Case fatality rate 	MoH Clinical Management	Funds (Continuous activity)

⁸ Refer to Component IV. ER1

⁹ Refer to Component IV. ER1

¹⁰ Assessment should include training gaps and other capacity needs such as medical supplies, and equipment, etc.

Activities	Outputs	Responsible	Resources
outcome of severe cases (DHF/DSS)		Committee WHO	
17.7 Conduct mortality review	<ul style="list-style-type: none"> Chart review Clinical audit 	MoH Clinical Management Committee	Experts Funds (Continuous activity)
17.7 Establish/Strengthen capacity at blood bank so these can respond to DHF/DSS	<ul style="list-style-type: none"> A system in place capable of addressing adequately needs in complicated cases 	MoH Partners	Funds Equipment Human Resources (Q1, 2009)
Expected Result 18:			
Laboratory support for case management improved			
18.1 Conduct situation analysis on clinical laboratory capacity including private sector	<ul style="list-style-type: none"> Situation analysis report with identified gaps on infrastructure, supplies and human resources 	MoH Clinical Management Committee Partners	Expert Funds Private sector (Q1, 2009)
18.2 Strengthen capacities (supplies, infrastructure)	<ul style="list-style-type: none"> Laboratories are properly equipped 	MoH Public and private health laboratories.	Funds Private sector Experts (Q3, 2009)
18.3 Capacity building – personnel – develop training modules	<ul style="list-style-type: none"> Training programmes and modules and content areas 	MoH Public and private health laboratories clinical management committee	Funds Private sector Experts (Q2, 2009)
18.4 Conduct training	<ul style="list-style-type: none"> Training results and reports 	MoH WHO Clinical Management Committee Public and private health laboratories	Funds Private sector Experts (Q3-4, 2009)
18.5 Monitor implementation of laboratory practices	<ul style="list-style-type: none"> Monitoring reports showing extent to which targeted facilities adhere to guidelines Targeted facilities with effective system in place 	MoH WHO clinical management committee Public and private health laboratories	Funds Private sector Experts (Q1, 2010)
18.6 Quality control of laboratory facilities (following national/WHO guidelines)	<ul style="list-style-type: none"> Checklist Blind controls 	MoH WHO Clinical Management Committee public and private health laboratories	Funds Private sector Experts (Continuous, from Q1, 2010)
Expected Result 19:			

Activities	Outputs	Responsible	Resources
Referral network system in public and private sectors established.			
19.1 Set up proper referral network mechanisms	<ul style="list-style-type: none"> • Documented referral network system available • Impact assessments on CFR available 	MoH Clinical Management Committee Partners	Human resources Funds Private sector involvement (Q1, 2009)
19.2 Make provisions for hotline consultation and communication	<ul style="list-style-type: none"> • Functional hotline in place • Regular monitoring mechanisms of hotline • Impact assessments of hotline on CFR 	MoH Clinical Management Committee Partners (Practitioners)	Human resources Funds Private sector involvement (Q1, 2009)
19.3 Provision of adequate transport facilities of potentially complicated cases	<ul style="list-style-type: none"> • Regular monitoring reports especially during outbreaks. • Impact assessments on CFR 	WHO, MoH Clinical Management Committee Partners	Human resources Funds Private sector involvement (Q1, 2009)

Component IV: Social mobilization and communication

Planning elements	Indicators	Verification source	Assumptions and risks
Regional goal			
To reduce the disease burden due to major parasitic and vector-borne diseases to such an extent that they are no longer major public health problems			
Regional objective			
To reduce incidence rates of dengue fever and dengue haemorrhagic fever	<ul style="list-style-type: none"> The rising trend in dengue stemmed between 2008-2010, relative to 2005-2007 Regional average reported incidence rate reduced by at least 20% (2010-2012 average versus 2005-2007) Regional average reported incidence rate reduced by at least 20% (2013-2015 average versus 2010-2012) Impact of outbreak mitigated¹¹ 	<p>Regular WHO updates</p> <p>Dengue outbreak response report</p>	<p>Political commitment</p> <p>Funds</p> <p>Human Resources</p> <p>Coordination and surveillance systems in place</p>
Purpose			
To promote collaboration among affected communities, national health agencies and major stakeholders to implement dengue programmes for behavioural change	National Dengue Control Programme engaged in community-based social mobilization and communication strategies aimed at changing behaviours towards dengue prevention and control	Regional and national plans	<p>Political commitment</p> <p>Funds</p> <p>Interest and commitment of communities and other major stakeholders</p>
Expected Results			
20. COMBI resource group ¹² for COMBI implementation established	<ul style="list-style-type: none"> Resource group established and interacting with relevant agencies of dengue control programme 	Reports from resource group	<p>Funds</p> <p>COMBI expert</p> <p>Availability of resource groups/ coordinator</p>
21. Assessment including	<ul style="list-style-type: none"> Assessment reports by 	Assessment report	Funds

¹¹ Measured by morbidity and mortality rates, number of cases, geographical containment, and duration of outbreak.

¹² COMBI Resource Group is conceived as a professional service provider to support development and implementation of COMBI programmes, training of personnel and impact assessment.

Planning elements	Indicators	Verification source	Assumptions and risks
situation analysis of current strategies (social mobilization/health education) and extent and success of COMBI if implemented (with respect to dengue and other vector-borne diseases)	Member States		Social/behavioural expert
22. COMBI training implemented	<ul style="list-style-type: none"> Number of countries benefiting from COMBI training 	Training materials Training report	Funds Experts Political commitment
23. COMBI approach disseminated and promoted.	<ul style="list-style-type: none"> Number of Member States committed to COMBI 	Promotional materials Reports of activities Mission reports	Other social mobilization approaches have not been effective
24. Development and implementation of COMBI plan supported	<ul style="list-style-type: none"> Number of Member States adopt COMBI in their national plans Number of Member States designate National COMBI focal point 	COMBI Plan National COMBI focal point	Political endorsement Funds Availability of resource group
25. Partnerships set up with private sector/and other multi-stakeholders	<ul style="list-style-type: none"> Number of partnership agreements (i.e. MoU) with private sector and other multi-stakeholders 	Memoranda of understanding Reports of meetings and joint planning exercises	Interest of private sector and other major stakeholders

Activities	Outputs	Responsible	Resources	Timeline
Expected Result 20:				
COMBI resource group¹³ for COMBI implementation set up				
20.1 Prepare terms of reference for COMBI Resource Group	<ul style="list-style-type: none"> Terms of reference 	WHO COMBI experts (in consultation with Member countries)	Funds	First quarter of year one
20.2 Identify experts/practitioners with experience in COMBI training, implementation and assessment, and	<ul style="list-style-type: none"> Roster of qualified experts and their availability Multi-agency/multi-sector COMBI 	WHO COMBI experts (in consultation with Member countries)	Political commitment Funds Expert	First quarter of year one

¹³ COMBI Resource Group is conceived as a professional service provider to support development and implementation of COMBI programmes, training of personnel and impact assessment.

Activities	Outputs	Responsible	Resources	Timeline
social mobilization and communication	resource group established			
20.3 Convene meeting and brief resource group	<ul style="list-style-type: none"> Business plan 	WHO COMBI experts (in consultation with Member countries)	Funds Expert	Second quarter of year one
Expected Result 21: Assessment including situation analysis of current strategies (social mobilization/health education) and extent and success of COMBI if implemented (with respect to dengue and other vector-borne diseases)				
21.1 Develop a ToR on process for conducting the assessment	<ul style="list-style-type: none"> TOR 	Resource Group (in consultation with Member countries)	Funds	Second quarter of year one
21.2 Conduct the assessment for each Member State	<ul style="list-style-type: none"> Assessment report 	Resource group Member countries	Funds Expert	Third and fourth quarter of year one
Expected Result 22: COMBI training implemented				
22.1 Modify COMBI training curriculum adapted to country setting and based on the outcome of the assessment	<ul style="list-style-type: none"> Modified training curriculum 	Resource group Member countries	Funds Political commitment Expert	First quarter of year two
22.2 Conduct COMBI training	<ul style="list-style-type: none"> COMBI training conducted 	Resource group Member countries	Funds Political commitment Expert	Second quarter of year two
Expected Result 23: COMBI approach disseminated and promoted				
23.1 Request each Member country to designate a country COMBI team	<ul style="list-style-type: none"> Local COMBI teams appointed 	Resource group Member countries	Political commitment	Third quarter of year two
23.2 Compile COMBI orientation package	<ul style="list-style-type: none"> COMBI package developed (available at e.g. website, etc.) 	Resource group	Funds Expert	Third quarter of year two
23.3 Advocate COMBI to stakeholders at the country level	<ul style="list-style-type: none"> Report of advocacy meetings with stakeholders 	Resource group Country COMBI teams	Funds	Third and Fourth quarter of year two
Expected Result 24: Development and implementation of COMBI plan supported				

Activities	Outputs	Responsible	Resources	Timeline
24.1 Facilitate the development of country COMBI plans	<ul style="list-style-type: none"> Country COMBI plans developed 	Resource group (in collaboration with country COMBI teams)	Funds Expert	Fourth quarter of year two
24.2 Secure funding and resources needed before implementation	<ul style="list-style-type: none"> Funding/resources secured 	Country COMBI teams Resource Group	Expert Political Commitment	Fourth quarter of year two
24.3 Implement COMBI Plan	<ul style="list-style-type: none"> Plan implemented 	Country COMBI team (supported by Resource Group)	Funds Expert Human resources	First quarter of year three
24.4 Monitor and evaluate implementation of COMBI plan	<ul style="list-style-type: none"> Progress and evaluation reports Publication of experiences 	Country COMBI team (supported by Resource Group)	Funds Human resources Expert	From second quarter of year three
Expected Result 25:				
Partnerships set up with private sector/and other multi-stakeholders				
25.1 Identify key stakeholders (e.g. donor communities, private sectors) who can make significant contributions towards dengue control programme at regional level	<ul style="list-style-type: none"> Stakeholders identified 	Resource Group (in consultation with Member countries) Stakeholders	Political Commitments	First quarter of year one
25.2 Formalize partnerships through MoU	<ul style="list-style-type: none"> MoU defining roles and commitments of each partner 	Resource Group (in consultation with Member countries) Key stakeholders/ partners	Political Commitments Funds	2 nd Q of year one
25.3 Develop workplans	<ul style="list-style-type: none"> Strategies and activities defined in workplan/proposals 	Resource Group (in consultation with Member countries) Key stakeholders/ partners	Funds Expert	Second and third quarter of year one
25.4 Implement commitments	<ul style="list-style-type: none"> Report of accomplishments 	Resource group (in consultation with Member countries) Key stakeholders/ partners	Funds Human resources	Third quarter of year one
25.5 Disseminate reports and achievements	<ul style="list-style-type: none"> Publication 	Resource Group (in consultation	Funds	From third quarter of year

Activities	Outputs	Responsible	Resources	Timeline
	<ul style="list-style-type: none">Media exposure	with Member countries) Key stakeholders/ partners	Expert	one

Component V: Outbreak response

Planning elements	Indicators	Verification source	Assumptions and risks
Regional goal			
To reduce the disease burden due to major parasitic and vector-borne diseases to such an extent that they are no longer major public health problems			
Regional objective			
To reduce incidence rates of dengue fever and dengue hemorrhagic fever	<ul style="list-style-type: none"> The rising trend in dengue stemmed between 2008-2010 relative to 2005-2007 Regional average reported incidence rate reduced by at least 20% (2010-2012 average versus 2005-2007) Regional average reported incidence rate reduced by at least 20% (2013-2015 average versus 2010-2012) Impact of outbreak mitigated¹⁴ 	<p>Regular WHO updates</p> <p>Dengue outbreak response report</p>	<p>Political commitment</p> <p>Funds</p> <p>Human resources</p> <p>Coordination and surveillance systems in place</p>
Purpose			
To increase capacity to predict, detect early and respond to dengue outbreaks.	<ul style="list-style-type: none"> Number of Member States with an effective early warning system in place and articulated into existing epidemic response (i.e. pandemic influenza; Global Outbreak Alert Response Network) Number of Member States that have allocated financial and human resources for outbreak response for dengue Number of Member countries with a rapid response system in place and the core capacity to respond as per IHR requirements 	<p>Emergency operation centre records and IHR focal point appointed</p> <p>National plans and budgets</p> <p>Bureau of Epidemiology/IHR focal point reports</p>	<p>Political commitment</p> <p>Funds</p> <p>Human resources</p>
26. Early warning system/dengue surveillance system developed and scaled up	<ul style="list-style-type: none"> Number of countries having operationalized early warning system based on disease surveillance data, epidemiological information, virus serotypes (from 	Member States' surveillance reports.	<p>Political commitment</p> <p>Funds</p> <p>Human resources</p> <p>Functional surveillance system</p>

¹⁴ Measured by morbidity and mortality rates, number of cases, geographical containment, and duration of outbreak

Planning elements	Indicators	Verification source	Assumptions and risks
	Component I), vector densities/distribution (from Component II) and environmental data (i.e. rainfall, temperature) and notify within (xx) period of time		
27. Dengue outbreak standard operating system developed	<ul style="list-style-type: none"> • Number of Member States with Dengue Outbreak Standard Operating Procedures (SOP) in place • Number of Member States with adequate designated staff and necessary infrastructure in place • Numbers of countries having the capacity to respond to dengue outbreaks following SOP 	<p>Standard Operating Procedure Manual</p> <p>Staffing records</p> <p>National plans and SOP manuals.</p>	Funds Experts
28. Coordination mechanisms within MoH and with other programmes and sectors established	<ul style="list-style-type: none"> • Number of Member States with functional intersectoral dengue emergency taskforce 	TOR: Dengue Emergency Taskforce Reports of task Force	Funds Experts
29. Intercountry coordination mechanisms in place	<ul style="list-style-type: none"> • Number of inter-country meetings held • Number of biregional coordinating meetings 	Intercountry meeting reports Bi-regional meeting reports	Funds Political commitment
30. A mechanism to incorporate rumour surveillance developed and implemented	<ul style="list-style-type: none"> • Number of Member States with a mechanism (IHR framework) incorporating rumor surveillance into the national surveillance system • Number of Member States with a system incorporating focal persons (health workers) to verify rumours in the community • Number of countries with the capacity to verify outbreaks within (xx) hours 	<p>National surveillance reports</p> <p>WHO/partners mission reports, outbreak investigation team reports</p>	Funds Experts Political commitment
31. Regional outbreak response guidelines developed	<ul style="list-style-type: none"> • Regional outbreak response guidelines available 	Copy of regional guidelines	Funds Experts Human Resources

Planning elements	Indicators	Verification source	Assumptions and risks
32. The ability of health workers to respond to the dengue outbreak strengthened	<ul style="list-style-type: none"> Number of Member States with outbreak response guidelines and training manuals for health workers available Number of Member States with responsible health workers trained on outbreak response SOPs 	National training report ¹⁵ Staffing records	Funds Human resources Staff motivation
33. Risk communication plan developed	<ul style="list-style-type: none"> Risk Communication Plan with clear roles and responsibilities in communicating with the public Number of Member States with programmes incorporating risk communication included in their National Plan Number of Member States with standard operating procedure for media interaction 	Copies of regional risk communication plan National plan. Written SOPs.	Political commitment Funds Experts

Activities	Outputs	Responsible	Resources
Expected Result 26			
National Early Warning System/Dengue Surveillance System developed and scaled up			
26.1 Agree and adhere to components of early warning system	<ul style="list-style-type: none"> Outbreak response plans Adherence to IHR commitments 	MoH* WHO	Political commitment Funds Human resources Functional EOC at MoH and WHO (Fourth quarter of year two)
26.2 Develop guidelines for early warning systems	<ul style="list-style-type: none"> Guidelines 	MoH* WHO	Funds Experts (Fourth quarter of year two)
26.3 Develop indicators for forecasting of outbreaks	<ul style="list-style-type: none"> Expert meeting report 	WHO Experts	Funds Availability of experts (Fourth quarter of year 2)
26.4 Establish system of weekly reporting	<ul style="list-style-type: none"> Weekly reports 	MoH*	Political commitment Funds

¹⁵ Showing results of competence tests on SOPs and Guidelines

* Or relevant agency

Activities	Outputs	Responsible	Resources
			(First quarter year of 3)
Expected Result 27: Dengue outbreak standard operating system developed			
27.1 Development of SOP including triggers for declaring outbreaks and defining stakeholders and their roles and responsibilities	<ul style="list-style-type: none"> SOP Manual 	MoH* WHO (tech advice)	Political commitment Funds Human resources (Fourth quarter- year 1)
27.2 Training in the use of SOP	<ul style="list-style-type: none"> Training report 	MoH* WHO	Funds Human resources (Second quarter - year 2)
27.3 Monitoring use of SOP	<ul style="list-style-type: none"> Monitoring reports 	WHO MoH*	Funds Human resources (Annual Exercise beginning four quarter - year 2)
Expected Result 28: Coordination mechanisms within MoH and with other programmes and sectors established			
28.1 Constitute an intersectoral dengue emergency task-force	<ul style="list-style-type: none"> Intersectoral taskforce coordinated by MOH* Minutes and records resulting from intersectoral meetings within the public as well as involving the private sector 	MoH* WHO Other sectors (*or relevant agency)	Political commitment Funds Human resources Interest of other sectors (First quarter – Year 2)
28.2 Collaboration with other health programmes and disease surveillance	<ul style="list-style-type: none"> Interdepartmental joint plans, reports and records of intervention 	MoH WHO	Funds Political commitment (Second quarter – Year 2)
Expected Result 29: Intercountry coordination mechanisms in place.			
29.1 Intercountry coordination meetings (4-5)	<ul style="list-style-type: none"> Meeting reports 	WHO MoH	Political commitment Funds Human resources (?)
29.2 Biregional meetings (2)	<ul style="list-style-type: none"> Meeting reports 	WHO	Funds (?)
29.3 Share-point site or equivalent inter-country and biregional communication mechanism	<ul style="list-style-type: none"> Electronic communication system in place 	MoH WHO	Funds Human resources (Second quarter – Year 2)

Activities	Outputs	Responsible	Resources
Expected Result 30:			
A mechanism to incorporate event-based surveillance developed and implemented			
30.1 Establish effective media/rumours scanning mechanism	<ul style="list-style-type: none"> Effective media scanning mechanism in place 	Ministry of Information MoH WHO	Political commitment Private media's willingness Funds Human resources (Second quarter -Year 2)
30.2 Strengthen rumour verification mechanism	<ul style="list-style-type: none"> Effective rumour verification mechanism in place 	MoH WHO Partners (e.g. CDC)	Political commitment Funds Human resources (First quarter – Year 3)
Expected Result 31:			
Regional outbreak response guidelines developed			
31.1 Develop regional outbreak response guidelines and SOP targeting different levels	<ul style="list-style-type: none"> Guidelines SOP 	MoH WHO	Political commitment Funds Experts (Second quarter – Year 2)
Expected Result 32:			
The ability of health workers to respond to the dengue outbreak strengthened			
32.1 Mapping of personnel already engaged in outbreak response (e.g. AI)	<ul style="list-style-type: none"> Inventory of trained staff in outbreak response (e.g. AI) 	MoH Other relevant ministries (e.g. Environment) WHO	Political commitment Funds Human resources (Second quarter - Year 1)
32.2 Training need assessment.	<ul style="list-style-type: none"> Assessment report 	MoH WHO	Funds Human resources (Second quarter - Year 1)
32.3 Training in outbreak response	<ul style="list-style-type: none"> Training reports 	MoH Other ministries (e.g. Ministry of Environment) WHO	Political commitment Funds Human resources (Second quarter – Year 2)
Expected Result 33:			
Risk communication plan developed			
33.1 Develop risk communication plan into dengue outbreak SOP and incorporate risk communication components specific	<ul style="list-style-type: none"> Risk communication plan to be incorporated into dengue outbreak SOP Risk communication components specific to dengue incorporated into 	MoH Other Ministries (e.g. Environment) WHO	Political commitment Funds Human resources (Fourth quarter – Year 1)

Activities	Outputs	Responsible	Resources
to dengue into existing epidemic alert and response risk communication plan	existing epidemic alert and response risk communication plan		
33.2 Training of focal points in all relevant aspects of risk communication	<ul style="list-style-type: none"> • Training reports 	MoH Other Ministries (e.g. Environment) WHO	Funds Human resources (Second quarter – Year 2)
33.3 Collaborate with other sectors to harmonize implementation of risk communication	<ul style="list-style-type: none"> • Joint plans • Intersectoral meeting reports 	MoH Other ministries (e.g. Ministry of Environment) WHO	Funds Human resources (Fourth quarter – Year 2)

Component VI: Research

Planning elements	Indicators	Verification source	Assumptions and risks
Regional goal			
To reduce the disease burden due to major parasitic and vector-borne diseases to such an extent that they are no longer major public health problems			
Regional objective			
(To reduce the morbidity and mortality rates due to DF/DHF)	<ul style="list-style-type: none"> The rising trend in dengue stemmed between 2008-2010 relative to 2005-2007 Regional average reported incidence rate reduced by at least 20% (2010-2012 average versus 2005-2007) Regional average reported incidence rate reduced by at least 20% (2013-2015 average versus 2010-2012) Impact of outbreak mitigated¹⁶ 	<p>Regular WHO updates</p> <p>Dengue outbreak response report</p>	<p>Political commitment</p> <p>Funds</p> <p>Human resources</p> <p>Coordination and surveillance systems in place</p>
Purpose: To address programmatic issues and gaps which require new or improved tools for effective dengue prevention and control	<ul style="list-style-type: none"> Programmatic issues and gaps identified Research priorities identified Programmatic issues and gaps successfully addressed through research 	<p>Situation analysis reports</p> <p>Research findings (e.g. publications, reports, etc.)</p>	<p>Political commitment</p> <p>Funds</p> <p>Experts</p> <p>Human resources</p>
Expected Results			
34. Operational research capacity in dengue of existing academic/scientific institutions in Member states enhanced	<ul style="list-style-type: none"> Number of reports/publications specifically addressing programmatic gaps Number of collaborating centres participating in operational research Number of institutions engaged in twinning or collaborations/partnerships within or outside the region per year Number of grants directly addressing programmatic gaps 	<p>Publications</p> <p>List of WHO collaborating centres</p> <p>List of MoU, joint research protocols and implemented projects</p> <p>Grant agreements</p>	<p>Political commitment</p> <p>Commitment of academic sector/national research councils or Ministries</p> <p>WHO CCs commitment</p> <p>Funds</p> <p>Experts</p> <p>Human resources</p>

¹⁶ Measured by morbidity and mortality rates, number of cases, geographical containment and duration of outbreak

Planning elements	Indicators	Verification source	Assumptions and risks
	in both regions		
35. Disease burden estimated (epidemiologic impact, social costs and cost of illness)	<ul style="list-style-type: none"> • Number of countries engaged in disease burden estimate studies • Number of countries that have completed disease burden estimates 	Country reports	Political commitment Commitment of academic sector/ national research councils or ministries WHO CCs commitment Funds Experts Human resources
36. New knowledge gained, new tools developed, existing tools improved and new strategies created	<ul style="list-style-type: none"> • Number of research projects per country addressing development of tools • Number of countries where new tools are being researched • Number of countries where new or improved tools are being validated 	Publications or reports Country/programme reports	Political commitment Commitment of academic sector/ national research councils or ministries/private sector WHO CCs commitment Funds Experts Human resources
37. Evaluation of tools and strategies for dengue control and case management	<ul style="list-style-type: none"> • Number of cost-evaluation studies involving new and improved tools • Number of cost-evaluation studies involving new and improved strategies • Number of economic studies such as cost minimization, cost-effectiveness, cost of utility and budget impact, etc. 	Publications or reports Country/programme reports	Political commitment Commitment of academic sector/ national research councils or ministries/private sector WHO CCs commitment Funds Experts Human resources
38. Translation of new improved tools into programmatic activities	<ul style="list-style-type: none"> • Number of programmes in Member States adopting research recommendations in policy formulation and programme implementation • Number of programmes publishing operational research findings • Number of countries that have established research priorities based on programme needs 	Country/programme reports	Political commitment Commitment of academic sector/ national research councils or Ministries WHO CCs commitment Funds Experts Human resources

Activities	Outputs	Responsible	Resources
Expected Result 34: Operational research capacity in dengue of existing academic/ scientific institutions in Member States enhanced			
34.1 Map of research institutions, researchers and research networks in the two regions	<ul style="list-style-type: none"> Listing inventory 	WHO MoH/MEWR/MOSTI and other relevant ministries	Funds Human Resources (Year 1)
34.2 Conduct workshops to develop operational research protocols	<ul style="list-style-type: none"> Workshop reports Research protocols 	WHO TDR Research councils/academic institutions	Funds Experts Human resources (established in year 1 and ongoing)
34.3 Set up a system for information exchange	<ul style="list-style-type: none"> Sharepoint or other system 	WHO Research councils/academic institutions MoH/MEWR/MOSTI and other relevant ministries	Political commitment and interest of research institutions Funds Expert Human resources (established in year 1 and ongoing)
34.4 Training in applied and operational research	<ul style="list-style-type: none"> People trained in operational research 		(established in Year 1 and ongoing)
34.5 Brokering national and international twinning arrangements and collaboration	<ul style="list-style-type: none"> Twinning arrangements in place 		(established in Year 1 and ongoing)
Expected Result 35: Disease burden estimated (epidemiologic impact, social costs and cost of illness)			
35.1 Conduct situation analysis on information gaps to estimate disease burden	<ul style="list-style-type: none"> Situation analysis report 	MoH/MEWR/MOSTI and other relevant ministries WHO	Funds Experts Human resources Years 1 and 2
35.2 Develop a protocol for disease burden estimation	<ul style="list-style-type: none"> Protocol 	WHO	Funds Experts Years 1 and 2
35.3 Develop methodologies to estimate prevalence incidence and mortality from available data	<ul style="list-style-type: none"> Develop methodologies 		Years 1 and 2
35.4 Conduct research and publish studies and	<ul style="list-style-type: none"> Report/publications 	Researchers/academic institutions/CCs	Political commitment and interest of

Activities	Outputs	Responsible	Resources
use these for advocacy	<ul style="list-style-type: none"> Advocacy reports 	WHO MoH/MEWR/MOSTI and other relevant ministries	research institutions Funds Expert Human resources Year 2 and ongoing
Expected Result 36: New knowledge gained, new tools developed, existing tools improved and new strategies developed			
36.1 Develop and test new surveillance tools and mechanisms	<ul style="list-style-type: none"> GIS system in place Effective surveillance and predictive tools developed Identification of risk factors 	Researchers/academic institutions/CC WHO MoH/MEWR/MOSTI and other relevant ministries	Political commitment and interest of research institutions Funds Experts Human resources Year 1 and ongoing
36.2 Evaluate improved and new vector and other preventive control strategies and tools	<ul style="list-style-type: none"> Evaluation reports and/or publications Results of multicenter studies addressing key indicators 	Researchers/academic institutions/CC WHO MoH/MEWR/MOSTI and other relevant ministries	Political commitment and interest of research institutions Funds Experts Human resources Year 1 and ongoing
36.3 Conduct studies on biomarkers in DHF/DSS	<ul style="list-style-type: none"> Publications 	Researchers/academic institutions/CC WHO MoH/MEWR/MOSTI and other relevant ministries	Political commitment and interest of research institutions Funds Experts Human resources Year 1 and ongoing
36.4 Develop new and improved case management strategies in DHF/DSS	<ul style="list-style-type: none"> Report/publication 	Researchers/academic institutions/CCs WHO MoH/MEWR/MOSTI and other relevant ministries	Political commitment and interest of research institutions Funds Experts Human resources Year 1 and ongoing
36.5 Collaborate in the development of new products and technologies	<ul style="list-style-type: none"> Collaboration progress reports/monitoring reports of vaccine trials Collaboration progress reports/Monitoring reports of vaccine drug trials Collaboration progress reports/monitoring reports resulting from development of 	Researchers/academic institutions/CC/Private sector MoH/MEWR/MOSTI and other relevant ministries	Political commitment & interest of research institutions, private sector & other stakeholders Funds Experts Human resources Year 1 and ongoing

Activities	Outputs	Responsible	Resources
	new diagnostic tools		
36.6 Conduct research on insecticide resistance	<ul style="list-style-type: none"> Results of research studies 	Researchers/academic institutions/CCs WHO MoH/MEWR/MOSTI and other relevant ministries	Funds Experts Year 1 and ongoing
36.7 Conduct studies on the effect of climate change on dengue	<ul style="list-style-type: none"> Reports/publications 	MoH/MEWR/MOSTI and other relevant ministries	Sector/national research Councils on ministries Funds Experts Year 1 and on-going
Expected Result 37:			
Evaluation of tools and strategies for dengue control and case management			
37.1 Conduct a review of costings of each of the programmes' strategic components	<ul style="list-style-type: none"> Report of cost analysis Publications 	MoH/MEWR/MOSTI and other relevant ministries WHO	Funds Experts
37.2 Develop protocol for evaluation studies (efficacy, effectiveness, accessibility, acceptability, feasibility and sustainability) in different settings	<ul style="list-style-type: none"> Protocol Publications 	Experts WHO	Funds
37.3 Perform cost studies on any existing or new dengue prevention, control and case management strategies including COMBI, intersectoral cooperation, integrated vector management, etc.	<ul style="list-style-type: none"> Proposals/protocols Reports and publications 	Experts WHO	Funds
37.4 Use evidence from cost studies for advocacy and mobilization of resources	<ul style="list-style-type: none"> Advocacy documents and materials Resources mobilization plan 	MoH/MEWR/MOSTI and other relevant ministries WHO Partners	Funds. Human resources
Expected Result 38:			
Translation of new improved tools into programmatic activities			

Activities	Outputs	Responsible	Resources
38.1 Conduct joint meetings/workshops to establish operational research priorities and dissemination of research findings	<ul style="list-style-type: none"> • Meeting reports • Publication of reports 	WHO TDR MoH/MEWR/MOSTI and other relevant ministries	Funds Experts Human resources
38.2 Participation of key researchers in programme managers meetings	<ul style="list-style-type: none"> • Programme managers meeting reports 	WHO TDR Research councils/academic institutions MoH/MEWR/MOSTI and other relevant ministries	Funds Experts Human resources
38.3 Established a working groups/taskforce/ liaison among programme staff and researchers who will coordinate, monitor and evaluate the integration of research findings into operations and policies	<ul style="list-style-type: none"> • Formal entity established • Appropriate allocation of resources 	MoH/MEWR/MOSTI and other relevant ministries	Funds Human resources