1. **Funding**
   LabNet should endeavour to find additional resources and new partners. However, given the current global financial crisis, countries are encouraged to include laboratory support in their surveillance budgets. Additional funds will be necessary to support the training programmes required to maintain the current high level of LabNet performance, to support the introduction of new techniques and to hire new staff. **Action:** Measles Programme, Measles Initiative, LabNet. **Timeline:** Ongoing

2. **Data reporting**
   There are a small number of countries which have yet to establish a regular procedure for reporting laboratory-based data to WHO and in some countries, laboratory based data are not directly linked to surveillance data. Members of the LabNet are encouraged to work with their national surveillance programmes to reconcile laboratory and surveillance data and to ensure this information is sent to WHO according to agreed upon reporting requirements. **Action:** Regional programme focal points, LabNet Regional Laboratory Coordinators. **Timeline:** Ongoing

3. **Indicators for elimination**
   LabNet laboratories in the regions targeting measles and/or rubella elimination goals will be required to meet elimination criteria surveillance indicators, including a requirement that >80% of laboratory-confirmed measles outbreaks have adequate samples for virus characterization tested in an accredited laboratory. To determine the additional resource needs for the LabNet it is recommended that reference and sequencing laboratories estimate their current ability to reach this indicator and determine the additional resource needs to fully meet it. **Action:** LabNet Sequencing Labs **Timeline:** First quarter 2011

4. **Proficiency testing programme**
   The LabNet continues to perform to a very high level in the serological PT programme. It is recommended that the scoring system be revised to be more compatible with testing routine samples and should encompass:
   - Test results
   - Completeness of providing all data used to determine test validity, including: kit lot numbers, cut-off values, positive and negative controls
   - Use of valid kits
   - Monitoring of transcription errors
   - Correct interpretation of results
   A new scoring system will be established to include the above parameters and will be introduced for the 2011 PT panel evaluation. **Action:** WHO HQ, VIDRL and LabNet **Timeline:** First quarter 2011

5. **New techniques**
   The new sequencing primers and positive controls for measles and rubella developed by CDC will be introduced to the LabNet with the appropriate protocols and will be provided at training workshops and to labs on request. **Action:** CDC **Timeline:** Ongoing
6. The procedural section of the Laboratory manual will be re-evaluated and updated where necessary. The key procedures identified for revision or development are:
   - trouble shooting guide for ensuring optimal cell sensitivity,
   - performing a serosurvey,
   - use of new RT-PCR and sequencing primers
   - appropriate use of real time RT-PCR
   - QA for molecular techniques
   - QC for oral fluid

The revised techniques/protocols will be posted on the WHO LabNet website and there will be consideration for publishing the revised manual electronically. **Action:** WHO, GSLs, LabNet **Timeline:** First quarter 2011

7. **Point of care rapid measles assay**
   The newly developed measles rapid point of care (POC) shows promising sensitivity and specificity when compared with detection of IgM in serum by EIA. It is recommended that the POC is further validated using samples collected under routine field conditions. **Action:** HPA, WHO HQ and AFRO **Timeline:** End 2010

8. **Sequence sharing**
   The sequence information generated by the LabNet over the past 4 years has been considerable and has proven invaluable for planning programmatic action. This data will become increasingly important for monitoring national and/or regional progress in attaining measles elimination. Timeliness of reporting has improved but there is evidence that some labs are waiting for publication before reporting information to WHO and/or the databases. Labs are reminded that sequence information is most useful when it is shared in a timely manner and of the LabNet requirements for reporting sequence data within 2 months of sample collection but preferably on a real time basis. **Action:** LabNet **Timeline:** Ongoing

9. **Sequence Databases**
   The WHO and MeaNS sequence databases are simple to use and have proven invaluable for monitoring and sharing sequence data. Timely submission of sequences to MeaNS allows all reporting criteria to be met in one action as these data are automatically submitted to the WHO database and optionally to GenBank. MeaNS also assists with characterization and QC of the virus sequence. However, at a minimum, measles virus genotypes are to be submitted to the WHO database, either through MeaNS or directly. For all rubella virus genetic information, the WHO database should be used with sequence data preferably also submitted to GenBank. **Action:** LabNet **Timeline:** Ongoing

10. **Data requirements**
    The minimum epidemiological data required for submission to the WHO databases are: WHO name, place and date of virus sample collection. Regional coordinators and country offices are to help collect any missing data. Changes on-line to previous submissions to the WHO database should also be directly notified to the curator to ensure they are reflected in the "master" database. **Action** LabNet **Timeline:** Ongoing

11. **Rubella genotypes**
    The SP sequences available from proposed reference viruses for provisional genotypes 1h, 1i, and 1j are: 1h: Minsk.BLR/28.05 AM258945; 1h: Novokuznetsk.RUS/04 EF421977; 1i: London.GBR/86 completed at CDC-USA; 1i: Milan.ITA/46.92 completed at CDC-USA; 1j: Kagoshima.JPN/22.04 AB285129; 1j: Miyazaki.JPN/10.01 AB285130. WHO should seek to have these viruses deposited in the WHO rubella virus strain banks to complete the process of making 1h, 1i, and 1j recognized genotypes. **Action** LabNet, **Timeline:** Agreement by end 2010

12. **Measles genotypes**
    Provisional genotype d11 should be recognized as a new measles genotype, D11, with the sequences of the reference strain, MVi/Menglian.Yunnan.CHN/47.09/1, provided by China CDC. Virus should be send to the WHO Strain Banks. **Action** China CDC, **Timeline:** October 2010
    Recognition should be given after laboratories have been able to analyse the reference sequences and report to WHO. **Action** LabNet **Timeline:** Agreement by end 2010
The genotype B3 sequences from Libya, Tunisia and Sudan should be considered as a third cluster in
genotype B3. Reference sequences to be provided by Institut Pasteur de Tunis. Virus from this cluster
should be send to the WHO Strain Banks. Action RRL Tunis, (October 2010) Recognition should be
given after laboratories have been able to analyse the reference sequences and report to WHO. Action
LabNet Timeline: Agreement by end 2010

LabNet laboratories should consider uniform naming convention for subgroups within genotypes
especially those that have global circulation patterns.
The recent changes in the list of recognized rubella and measles genotypes should be published in the
WER. A draft will be circulated to all GSLs, RRLs, and Regional Lab Coordinators. Action: CDC,
LabNet, Timeline: Draft by first quarter 2011

13. WHO should develop a mechanism for rapidly notifying LabNet of important developments such as
detection of a new lineage or genotype. These updates could be provided by a List Server or through a
“latest news” section in MeaNS or WHO Genotype SharePoint. Action: WHO HQ Timeline: First
quarter 2011

14. Analysis of sequences of the H and P genes of measles in addition to the standard sequencing window in
the N can allow finer mapping of chains of transmission. However, this level of analysis will not be
necessary in many countries and regions at this time. Some LabNet laboratories will perform the
additional sequencing which will form the basis of a LabNet recommendation to describe the situations in
which additional sequencing may be necessary. LabNet laboratories are encouraged to share their findings
with their colleagues in LabNet and to suggest sample sets that could be used to validate this method.
Action: GSLs, RRLs, WHO LabNet: Timeline: Second quarter 2011

15. Quality Assurance
Appropriate positive and negative controls should be run on all RT-PCR assays. Labs should strongly
consider using the synthetic positive control RNAs provided by CDC to help identify contamination in
PCR assays. Follow up to regional training courses which cover molecular techniques should include
testing a blind-coded “practice panel” of RNAs. Action: WHO, LabNet: Timeline: Ongoing

16. Transport of viruses on filter papers provides an economical mechanism to forward samples to RRLs and
GSLs for sequence analysis. LabNet laboratories should strongly consider these methods when sending
quarter 2010, ongoing

17. LabNet should develop quality control standards for molecular testing including the use of standard
controls, monitoring of assay performance, provision of PT panels for PCR and genotyping as well as
methods to evaluate the quality of sequence data. Action: WHO, LabNet Timeline: Protocols 1st quarter
2011, ongoing

18. A steering committee should be assembled to review and refines the protocols for accepting and
distributing sequence information via MeaNS and the WHO Database. The committee should include
specialists from the laboratory as well as epidemiology and bioinformatics. Action HPA, HQ Timeline:
Committee convened end 2010. Report to the 2011 Global Lab Meeting

19. A systematic review of rash causing diseases found to be non-measles and non-rubella by the LabNet
should be undertaken in selected countries and reported to the LabNet. Action: HPA, GSLs and Regional
Coordinators. Timeline: Report Global LabNet meeting 2011