

## Field Action Science Reports

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# THE FACTS (Field Action Science) Initiative

## POSITION PAPER

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### **I. THE OVERALL FACTS INITIATIVE CONCEPT**

Numerous actors operate, in developing countries and in the poorest zones of emerging and developed countries, to cope with issues related to poverty, health, education, environment and development generally. Governmental and non governmental organizations as well as many public, private, national and international institutions are involved in a myriad of actions in the field. All too frequently, these field actions are poorly evaluated while communication, cooperation and/or coordination between actors are lacking in efficiency. As a result, knowledge and know-how acquired through field action is poorly capitalized, and the limited resources devoted to promote access to essential goods and to preserve the environment are not used optimally, when they are not partially wasted. Mistakes are repeated while positive experiments are not. Recognition is often lacking. Numerous efforts to correct this situation have certainly led to some improvements, but in many cases this is insufficient. There is ample space for further ambitious initiative.

**It is argued here that on the whole field actions constitute a domain which is in a pre-scientific stage and that the community of actors who operate in the field would greatly benefit from the adoption of the rules prevailing in the scientific community<sup>\*</sup>.**

In many scientific areas, researchers perform experiments, which are reported in a format which is approved by the scientific community and published in scientific journals after having undergone a **peer review** process. This system provides an efficient evaluation mechanism, ensures communication, respects the freedom of actors, allows for competition as well as cooperation, and promotes recognition of the best work and of the best actors. Furthermore, scientific communities usually organize further communication, training and recognition of their members, through symposia, courses, awards, etc. The essential point is that, through mechanisms which have proven their efficacy over decades, the community is internationally self-organized in a bottom-up fashion. On the other hand, funding bodies operate top-down, even if they do base part of their evaluation and decisions upon the evaluations (i.e. largely the publications) produced within the community itself.

It seems clear that if such mechanisms were used by field actors, better evaluation, better communication and better capitalization of knowledge and know-how as well as better recognition would follow while they would remain free to compete or cooperate as they wished. This type of international, largely self-governed organization is missing, and this is, in part, why the more top-down approaches have proven insufficient, particularly in the evaluation of programs which rely upon a large number of varied field actions. To illustrate

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<sup>\*</sup> This concept was initially developed in a report dealing with infectious diseases written by Ph.Kourilsky for the French Government "Optimizing French action on research and the surveillance of infectious diseases worldwide» (La Documentation Française - Jan. 2007; see specifically pp.195-196 and recommendations # 10 - 11).

the parallel, one should consider how research funding agencies (such as NIH in the United States, ANR in France, etc.) would operate and fulfill this mission if there were no scientific publications to start with.

The aim of the FACTS (Field ACTION Science) Initiative is thus to help field actors to appropriate, for their own sake and benefit, some of the operational rules which have proven useful and efficient in the area of science. Can this objective be achieved? And if so, how?

Assuming that field action can be likened to a science (which, so far, does not know that it is a science), an analysis of the way in which new scientific areas emerge is useful. What usually occurs is that some of the most internationally respected leaders in the field informally agree that the time is ripe to organize scientific meetings and often to launch a new scientific Journal. In the present case, this process does not and cannot take place as such because it requires a pre-existing scientific organization culture, which is precisely what is missing.

Discussions took place with a number of field actors, starting with representatives of developing countries and of various NGOs<sup>†</sup>. The feedback was mainly very positive. The overall project was judged to be quite ambitious since it involves a definite cultural change in the broad and diverse community of field actors. Some skepticism was expressed, but more as regards feasibility than on the validity of the overall goals. Pertinent questions were raised and were extremely useful to formulate the project as it now stands (see below).

Renowned personalities in the field also reacted most positively. Representatives of various national and international funding bodies were highly supportive, acknowledging that large amounts of money are currently being spent, sometimes incorrectly spent, without proper evaluation and with questionable efficiency. If successful, the FACTS Initiative would, in their view, contribute to more efficient use of available resources, while substantial amounts could possibly be saved and redirected to better effect.

## **II. FOCUSING ON “FACTS REPORTS”**

### **A. The purpose of FACTS reports**

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<sup>2</sup> A number of these discussions took place during the Biovision Forum held in Lyons on March 11-14, 2007, and we wish to thank the organizers who actively facilitated these contacts.

These encouraging contacts lead to the decision to move ahead and to launch the FACTS Initiative. **The highest priority was given to the creation of FACTS Reports, an international electronic Journal devoted to field actions and endowed with a peer review process.** This choice was based upon the following considerations:

- The launch of such a Journal would fulfill several of the initiative's key objectives stimulating and involving (if successful) a significant cultural change in the community of field actors.
- Other activities (training courses, symposia, etc.) could be initiated in parallel or at a later date. They are not as immediately strategic as the electronic journal, which in fact would help these other activities to emerge and develop.
- The electronic character of the Journal is actually what makes the project feasible, because:
  - There is no major limit on the scope and volume of activities encompassed in the Journal.
  - Electronic classification is flexible and allows a broad diversity of readers to extract information of interest to them.
  - In appropriate conditions, the peer review process can be opened, so that comments by referees can enrich the article, as well as selected comments from other field actors which can be added progressively to the primary publication.
  - Costs can be kept relatively low, so that **an entirely free journal for both authors and readers** is not unrealistic.
  - The Internet is increasingly available in remote parts of the world, albeit sometimes at low speed (technically, attention must be given to publishing papers in a version which does not carry too much information, such as images, that would clog these slower channels).

## **B. Scope of the Journal**

The scope of the Journal was discussed on several occasions. FACTS Reports could cover a large number of areas: poverty, health, education, agriculture, rural development, urban growth and environmental issues in developing countries – as well as, according to some expressions of opinion, in the deprived areas of developed countries.

While electronic publication and classification of all these matters is feasible, it was considered impractical to cover them all initially, especially since some topics

require special expertise in terms of peer review. It was thus decided to create **a few (two or three) dedicated Editorial Boards**, to start publication in the corresponding areas and to broaden the coverage as and when success and experience progressed. **The first area to be covered will be Health**, the subject which is probably the closest to scientific culture, so that field actors may, in practice, be more receptive to the Initiative in spite of the various difficulties which were identified (see below).

The chosen approach is therefore pragmatic and somewhat opportunistic, because additional specialized areas can be opened at any point if appropriate editorial groups are motivated to get them started. In this way, the field could be progressively “paved” by growing numbers of Editorial Boards that at some point will need to be interconnected. In the longer term, a form of superstructure will need to be created to coordinate and supervise the various Boards. Although the issue need not be addressed in the immediate future, it does need to be kept in mind.

### **C. Peers and Editorial Boards**

**There should be no ambiguity concerning the fact that members of the Editorial Boards and peers involved in the review process will be field actors.** For example, a paper describing a local action run by the Red Cross will be refereed by a member of MSF and a local expert from another country – not by a World Bank expert or a professor from a western university. Field actors themselves would lead the process, not either the academic community or anyone else.

In this respect, the constitution of the Editorial Boards is crucial to the success of the Initiative. As in any other area of science, members of Editorial Boards should be experienced field actors, with recognized expertise. Their role will be either to evaluate the quality of the submitted articles themselves or more often to dispatch it to other peers (referees) and to check the relevance of observations made by the reviewers. This is the key for equitable judgment as well as for establishing the overall quality and recognition of the Journal. Also, the publication of referee reports (with their agreement) and of additional commentaries from readers will make it possible, thanks to electronic publication, to build up a small corpus around the initial paper. It is essential that the entire process is controlled by the Editors.

A general framework of instructions to authors has been drafted (Annex I), and will be provided to Editorial Boards for discussion. These guidelines can be adapted to a certain extent. Different Editorial Boards need not have exactly the same operating rules, as some may be more appropriate to specific communities. Moreover, freedom to experiment may be fruitful for the emerging FACTS Reports. Nevertheless, none of the adopted procedures must be allowed to compromise the overall quality and reputation of the Journal.

#### **D. Setting up quality criteria**

The above raises the inescapable and difficult issue of establishing quality standards, a long-standing and intense debate in scientific communities. The argument is often put forward that many important discoveries were never reported in the most prestigious journals and that some of them were in fact rejected.

Dealing with a new area and communities that are not familiar with these processes, it would be hazardous to try and establish from the start a highly elitist profile, based upon criteria of “excellence” which are in any case rather hard to define, especially in an emerging field.

**The preferred approach, therefore, would be to start by publishing reliable work, containing a certain element of novelty. The prime and non-negotiable quality of such work would be soundness and a factual (quantitative when possible) descriptive basis, so that it could be evaluated and reproduced by others.** Nevertheless, it is proposed to set up simultaneously several processes **to distinguish, amongst these publications, those which deserve special attention and/or recognition.** We believe that this approach, rather than discouraging many field actors by implementing *ab initio* an excessively elitist filter, would on the contrary, gradually create incentives to define excellence and recognize the best achievements.

#### **E. A prototype article**

In order to illustrate the type of work which in our view deserves to be published, colleagues were asked to write a report on the mobile laboratory which they designed to analyze the meningitis pandemic which is affecting the southern belt of the Sahel in Africa. The case is interesting in that the results of the

epidemiological study were published in a highly respected scientific journal without any description whatsoever of the mobile laboratory which facilitated it or made it possible. Conceivably, other efforts could capitalize on the practical knowledge which was acquired for that purpose.

This prototype paper was published on-line on the temporary FACTS Initiative web site (in the IVE website) (Annex II). Exceptionally, it was published before being sent to referees, but the reviewing process is under way and will also be reported.

#### **F. Articles, editorials and opinions**

In addition to the above articles, FACTS Reports will also publish editorials and opinions, for which a specific editorial process will be devised. The section devoted to these editorials and opinions should be kept to a reasonable size, but should meet the recognized need, voiced by many field actors, to develop additional ways of expressing their views. All major generalist scientific journals have such sections and FACTS Reports will do likewise, with the usual peer-reviewed papers.

### **III. PROBLEMS AND SOLUTIONS**

#### **A. Objections**

As mentioned above, the overall concept of the FACTS Initiative received broad and sometimes enthusiastic support, but a number of objections were raised. Obviously, the lack of capitalization of knowledge and know-how and its negative consequences of all kinds had been noted previously and there have been many efforts to correct the situation. Some have been successful, others have failed and the overall result remains unsatisfactory. Why would the FACTS Initiative be successful where other initiatives have failed? What forces hampered previous attempts? Have some difficulties been naively ignored?

Amongst the arguments which were debated, three are selected below for further discussion:

- There is nothing really new in the Initiative so that it could well fail as did previous attempts.
- Field actors are not experienced in writing according to scientific standards and unused to peer review.

- Even if capable of doing so, field actors work under the pressure of emergencies and are unwilling to write.

## **B. The FACTS Initiative and FACTS Reports display original features**

Many organizations, including NGOs, do have their own publications, and some of them devote a considerable amount of effort on reporting their best practices and results. A non-exhaustive benchmarking study was carried out and revealed a very large number of publications. Some of these are carefully reviewed, but the process is internal so that, rightly or wrongly, the quality and above all the independence of the information delivered (as opposed to money-raising “propaganda”) are not perceived as guaranteed.

A very few journals operate with peer reviews, but to date their scope is limited and peers are mostly members of the existing and informed scientific community, not field actors themselves.

The novelty of FACTS Reports resides in the combination of two factors:

- a) It relies on the field actors themselves and is not organized top-down as many evaluation tools are.
- b) It is fully electronic, which in fact, as emphasized earlier, is what makes the project realistic and feasible.

## **C. Is the lack of experience of field actors in scientific writing a real obstacle?**

This is the case of many field actors (but not all) and does constitute a serious problem for some of them, especially as the language of the journal will be primarily, if not exclusively, English. The language barrier is not the only one. Writing a paper in a scientific format, following basic rules such as separating facts from their discussion, is taught to all students, but even in a well organized scientific community the educational process takes some time.

One possibility is to ask benevolent members of the scientific community to provide help with drafting for those who request it. Electronic communication makes it possible to achieve an otherwise unattainable goal. In this way, the work can be sent to a French, Swedish or American scientist who would be willing to give up a few hours of his or her time to mentor authors in Mali or Eritrea writing up their work. Here again, there should be no misunderstanding. The scientist's

role is to mentor the drafting, not the work itself, so that the scientist need not be competent in that particular subject.

Representatives of the academic world have been contacted. Scientists are used to devoting a sizeable part of their time for the common good, including peer review, and are often ready to participate in generous action. We were therefore not surprised by the positive feedback. Accordingly, building a “Writing Assistance Desk” is included in the FACTS Report implementation plan (below).

#### **D. Would field actors be unwilling to write up and publish their work?**

This is another major issue, which reflects the very nature of much field action, especially in an emergency context. Two approaches could be adopted.

1. Interested institutions and organizations would make it known that publishing is, and will increasingly be, a positive factor for individual and collective promotion. NGOs could find it much to their advantage to encourage publication of work done by some of their members. Scientists usually publish their success stories rather than their failures. Field actors are invited to publish and to be recognized for their success stories. Their organizations should (and will) benefit legitimately from this process. For example, in the fullness of time, an NGO could improve its fund-raising on the basis of a good publication record.
2. Several incentives could be considered. Positive publicity can be given to selected field actions and field actors through a variety of mechanisms. In point of fact, this promotion would meet one of the objectives of the FACTS Initiative, namely to improve recognition in the field.

### **IV. THE IMPLEMENTATION PLAN**

#### **A. List of objectives and state of completion**

1. Finalizing the Honorary Board
  - The Honorary Board is composed of highly respected personalities who, **in their own name**, and not as representatives of any institution, support the Initiative. The Board plays no operational role, but will help in making contacts and in advocating the Initiative.

- **HONORARY BOARD**

Current Status (14/02/08)

Hélène Ahrweiler

President of the University of Europe; Former Rector of the Paris Academy

Michèle Barzach

Former French Minister of Health; President GlaxoSmithKline foundation

Jean-Claude Berthelemy

Professor at the University Paris 1 Pantheon Sorbonne

François Gros

Honorary Permanent Secretary, French Academy of Sciences

Mohamed Hassan

Executive Director, Third World Academy of Sciences

Pierre Marc Johnson

Former Prime Minister of Quebec

Bernard Kouchner

Founder of *Medecins Sans Frontières (Doctors Without Borders)*

Philippe Kourilsky

Professor at the Collège de France; Honorary Director General, Institut Pasteur

Federico Mayor

Former Director General of UNESCO; President, Fundación Cultura de Paz

François Nordmann

Former Ambassador of Switzerland to France

Rajendra K. Pachauri

Chairman, Intergovernmental Panel on Climate Change; Director-General, TERI

Mamphela Ramphela, Former Managing Director, World Bank; Former Vice-Chancellor, Cape Town University

Ellis Rubinstein

President, New York Academy of Sciences; President, Scientists Without Borders

Amartya Sen, Economist, Nobel laureate in Economics

Ismail Serageldin

Director, Library of Alexandria; Former Vice President Special Programmes, The World Bank

Elie Wiesel

Writer, Peace Nobel laureate

- **Prospects:**

The Board can still and should be broadened. A chairman of the Board is to be selected. More precise terms of reference for the Board will be drafted in cooperation with the future chairman. At this stage, Board members are regularly kept informed of the progress of the Initiative.

2. Setting up a succession of dedicated Editorial Boards

- As emphasized above (II-B, II-C, II-D), Editorial Boards will play a key role in the success of FACTS Reports implementation, and as explained above, a pragmatic approach was adopted.
- Two Editorial Boards have already been constituted, related to the topic of Health and Economy in developing countries. A nucleus of 10-12 editors is being co-opted. The co-optation process is progressing as follows: firstly, a number of names were collected through personal contacts. Secondly, motivated partners, including Médecins Sans Frontières (MSF = Doctors without Borders) and other NGOs agreed to help in contacting those who will be selected jointly, it being understood that the Editorial Board will be international, that Editors are appointed intuitu persona, and not as representatives of any institution, NGO or of any other body.

- **EDITORIAL BOARD: HEALTH**

Current Status (14/02/08)

**CHIEF EDITOR**

Bradford D. GESSNER, MD  
Director of the Maternal and Child Health Epidemiology Unit of the Alaska Division of Public Health  
Scientific Director of the “Agence de médecine préventive”, Paris, France (AMP)

**MEMBERS OF THE BOARD**

Carl BROWN  
CARICOM Secretariat

Abdullah BAQUI  
Community Health Division, International Centre for Diarrhoeal Disease Research

K. Monique WASUNNA  
Director, Center for Clinical Research

Alex EZEH  
Executive Director, APHRC

Yemane BERHANE  
Addis Ababa University, Faculty of Medicine

Oyewale TOMORI  
Vice Chancellor, Redeemer's University

Oumou BAH-SOW  
Medical Officer  
Tuberculosis Area of Work, Division for AIDS, TB and Malaria (ATM)  
World Health Organization /Regional Office for Africa (WHO/AFRO)

N.K.GANGULY  
Director General, Indian Council of Medical Research

Morenike UKPONG  
Nigeria HIV Vaccine and Microbicide Advocacy Group, Obafemi Awolowo  
University, College of Health Sciences, Department of Child Dental Health

Renaud PIARROUX  
Head of Laboratory parasitologie et mycology, Hopital Jean Minjoz Besançon

Tan Sri Datuk Dr Hj Mohd Ismail MERICAN  
Director General of Health - Ministry of Health – Malaysia

Rodrigo Correa De Olivera  
Brasil

▪ **EDITORIAL BOARD: ECONOMY**

Current Status (14/02/08)

**CHIEF EDITOR**

Jean-Claude BERTHELEMY  
Professor at the University Paris 1 Pantheon Sorbonne

**MEMBERS OF THE BOARD**

Olu AJAKAIYE  
Research Director  
African Economic Research Consortium

Ernest ARYEETAY  
Director of the Institute of Statistical, Social and Economic Research (ISSER) of  
the University of Ghana, Legon.

Martine AUDIBERT  
Research Director CNRS  
Member of the CERDI (Centre d'Etudes et de Recherches sur le Développement  
International)

Jean-Francis BENHAMOU  
Economist Infrastructure and Urbain Development (AFD)

Adama DIAW  
Professor – Director of the UFR of Economics  
Gaston Berger University  
Senegal  
Member of the Global Development network

Esther DUFLO

Professor at MIT

Ahmed GALAL  
Managing Director  
Economic Research Forum

George MAVROTAS  
Chief Economist  
Global Development Network

Fouzi MOURJI  
Professor Hassan II University  
Directeur du Laboratoire de statistique appliquée à l'analyse et à la recherche en économie (LASAARE) et coordonnateur du réseau Analyse économique et développement de l'AUF

Mamadou NDOYE  
Executive Secretary of the Association for the Development of Education in Africa (ADEA)  
Paris

Faraniaina E.R RAMAROSAONA - BERNARD  
Consultant in governance and anticorruption, and democracy and civic education promotion  
Madagascar

### 3. Setting up a Writing Assistance Office

- The concept of seeking assistance and mentoring in scientific communities to help field actors who wish to write-up their work has been discussed in detail (III-C).
- Current Status:  
The coordinator of the office has been already identified. Positive contacts and/or agreements have so far been made with:
  - The chairman of the Third World Academy of Sciences (TWAS) (Prof. Mohammed Hassan).
  - Senior representatives of the French Academy of Sciences (Prof. François Gros, Prof. Jean Dercourt) and from the College de France (Prof. Pierre Corvol).
  - The Chairman of the New-York Academy of Sciences (Prof. Elis Rubinstein).
  - The Chairman of the World Academy of Youth Scientists (WAYS) (Dr. Gaell Mainguy)

Additional contacts are being made, but it is already clear that setting up an assistance system to help field actors to write reports is a matter of organization and not of good will on the side of the scientists who are generally quite supportive.

- **Prospects:**

The plan is to set up a Writing Assistance Desk to match each Editorial Board. The various Writing Assistance Desks might ultimately be organized within a coordinated Writing Assistance Office. At this stage, a scientist willing to organize a network of voluntary researchers in the field of Health is being identified. His role will be to dispatch the requests within the network, following the process described in the Instructions to Authors (below).

#### 4. Implementing the electronic platform

- From its inception, the FACTS Initiative was supported by Institut Veolia Environment (IVE), a non-profit organization involved in future environmental trends studies. IVE is about to launch another electronic journal (SAPIENS) devoted to this aim. IVE has provided the expertise and the electronic format to launch FACTS Reports as well.

- **Current status:**

The electronic platform of FACTS Reports is ready for use. A filter remains to be added for low-speed Internet addressees.

Electronic handling of the scientific volunteer network involved in writing assistance desks raises no particular problem.

- **Prospects:**

The FACTS Initiative is currently hosted by the IVE website. An autonomous FACTS Reports website will be opened as soon as the Journal is ready to be launched.

#### 5. Creating incentives for field action authors

- Two types of incentives can be developed to stimulate field actors to write up their work. One originates from within organizations, and implies that they send appropriate messages to their members

through their internal pipelines. The other deals with external recognition of the published work, which can take place through a variety of mechanisms.

- **Current status:**

The approach followed so far has been to discuss informally with high-level members of several types of organizations including NGOs, international organizations such as the UN and OECD. It is more complicated and lengthy to obtain formal approval from any of these institutions, be they NGOs or other international organizations (and even certain academic institutions for the purpose of the Writing Assistance Office), as it requires approval by their governing bodies. In addition, formalizing some of the agreements must wait until the first Editorial Boards are formed and the various procedures involved in FACTS reports are in place.

- **Prospects:**

The appropriate time for further promotion will be when the journal is close to launch, i.e. when most procedures are in place, so that a number of institutions involved in the selected fields (including Health) can support the Initiative by providing positive signals and incentives to their personnel.

Regarding other incentives, a number of possibilities are being explored and will be discussed further. One is developing positive publicity for the Journal itself, but mostly for the authors of good papers. For example, the best papers might be selected and attention drawn to them in well established, specialized or generalist, scientific or broad audience, journals and media of various kinds. Launching prizes could be another type of promotion.

## 6. Fund-raising for FACTS Reports

- There are, so far, two major types of scientific journals (electronic or otherwise). Often, readers pay to access information. Alternatively, access is free but authors pay the cost of their publication. Sometimes, both pay a charge. Very few scientific journals are entirely

free of charge for both readers and authors, as FACTS Reports wishes to be. This requires:

- that the cost of the journal is kept low (which the Internet permits) ;
- that proper donations and/or subsidies cover the costs.

▪ **Current status:**

It was estimated that about **400,000 Euros** would need to be spent between now and the end of 2008 for the successful launch of a purely electronic journal which, by the end of that period, would have published **500 articles of 10 pages** each. This estimate must be refined, but this relatively low cost (which includes initial investment) is arrived at assuming that many volunteers (e.g. in the scientific community to mentor the writing) will not be charging so that personnel costs and others, (e.g. translators) will be kept low.

- Institut Veolia Environnement (IVE) has already paid a number of expenses and is committed to spend a further 150,000 Euros by the end of 2008.

- The recently launched World Life Science Foundation has been set up to develop actions which parallel the BioVision Forum (held yearly in Lyons, France and Alexandria, Egypt; additional events are planned). The Foundation has formally decided to support – as the 2007 Biovision Forum generously did - the FACTS Initiative, with an identical target of 150,000 Euros over the same period.

- Several private donors have been approached, with positive feedback. One of them has made a commitment to contribute 100,000 Euros.

It can therefore be stated that funding needed to launch FACTS Reports is secured until end 2008.

▪ **Prospects:**

If the enterprise is successful, there is no reason to believe that additional funds could not be found from at least two sources: private donors and foundations, as well as large funding bodies – which, according to preliminary contacts, are receptive to the notion that the

FACTS initiative will help them ultimately in many ways by saving or rather spending more effectively significant amounts of money. It is hoped that additional funding will not only support the development of FACTS Reports, but also of other actions (training courses, symposia, awards, etc.) under the FACTS Initiative umbrella.

#### 7. Setting up appropriate legal structures

- The FACTS Initiative generally and FACTS Reports in particular, should and will, **be appropriated by field actors and no one else**. This should eventually be translated into appropriate legal structures and governance. It should, however, be emphasized that much of the “power” resides in the Editorial Boards, who directly control the contents of FACTS Reports, the quality of the Journal and are ultimately responsible for the success of the operation. It is not considered that legal issues are a major priority at this stage with the exception of technical questions, such as handling of funds.
  
- Current status:  
A non profit organization under French law (association Loi 1901) was created under the name of “FIELD ACTIONS SCIENCE Initiative” (N° Ordre 07/1039 – N° Dossier 00180431 P; with four members as French law provides). Plans are to include formally within the organization the two non profit institutions which have so far decided to support the Initiative, namely Institut Veolia Environnement and the World Life Science Foundation.
  
- Prospects:  
Benchmarking other initiatives and institutions suggested various approaches. For example, the GAVI Alliance (known as the Global Alliance for Vaccines and Immunization) has operated for a number of years with a funding body separate from the operational body. The real issue for the FACTS Initiatives generally and FACTS Reports in particular, is that it will not be possible to conceive and design governance before a community of field actors is established. So far, the guiding principle was mainly to try and federate NGOs. The alternative approach which is suggested here is to **federate**

**individuals, independently of their organizations.** This is the usual rule in the scientific community where it does not generate any conflict of interest, due the common understanding that the advancement of knowledge and know-how is the ultimate goal which supersedes all others. This may well be the most fundamental issue and the most important challenge associated with the FACTS Initiative.

8. Giving appropriate publicity to the FACTS Initiative

- Publicity is an essential part of advocacy for the FACTS Initiative, which has to be widely advertised among field actors and their funding bodies.
  
- Current Status:  
A press release announcing the FACTS initiative and the future launch of Facts reports was published on March 13, 2007 during the Biovision Forum (Annex III), where it was advertised by a presentation leaflet distributed to participants (Annex IV) with the other Forum documents. Philippe Kourilsky was given the opportunity to describe the FACTS Initiative at the end of the Biovisionnaries plenary session of the Forum (March 14, 2007) and delivered a number of talks on the subject in various settings (College de France; Science-Po – the Institute for Political Studies in Paris; Asprocop – Association des Professionnels de Santé en Coopération, (Association of Health Professionals in the Cooperation Sector etc.).
  
- Prospects:  
Plans are to advertise broadly at the time of the launch of FACTS Reports. Several media professionals have generously offered their help.

**B. Agenda**

Planning is currently organized in 4 phases:

- Phase I: Preparing for launch ..... Beginning 2008
- Phase II: Launch ..... Fall 2008
- Phase III: Consolidation..... 2009
- Phase IV: Expand

The following chart, which includes the 8 majors types of action described above, provides more details on planning.

**Annex I      Instructions to authors**

## **ANNEX I: INSTRUCTIONS TO AUTHORS**

### **Guidelines for authors**

**V\_07/09/09**

#### **Introduction**

✓ *Object of the Journal*

FACTS Reports will address all aspects of operational work in developing country and underserved populations and territories: Health, Humanitarian Aid, Development, Environment, Education, Agriculture, Economics, and other relevant areas. The Journal welcomes practice-oriented papers, featuring knowledge gained from operational experience. The Journal will focus on science-based evaluations and reports but will not limit itself to these reports. Authors are encouraged to write about their own or their organization's experience, with reference to practical examples, and an emphasis on implications for field-based programs. Lobbying or campaign material and promotional information will not be published.

✓ *The Journal's targets*

FACTS Reports seeks to serve and target the field action community: non-governmental organizations (NGOs), academics, bilateral and multilateral agencies, public and private institutions, and individuals. The Journal is open to all practitioners.

✓ *Publishing Policy*

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## ANNEX II: PROTOTYPE PAPER

### **Mobile Laboratory to Improve Response to Meningitis Epidemics, Burkina Faso Epidemic Season 2004<sup>‡</sup>.**

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**Running head:** Mobile laboratory in Africa

**Keywords:** diagnosis, epidemics, laboratory, meningitis, mobile laboratory, treatment, vaccine response

#### **Abstract**

A Mobile Laboratory was developed for use primarily during the epidemic meningitis season in Burkina Faso. This report describes the Mobile Laboratory characteristics, its use to date, problems encountered and their resolution, and future directions. During 2004, the mobile laboratory intervention in three remote Burkina Faso districts experiencing meningitis epidemics led to more specific case management and led directly to vaccination of one district. However, in a second district, the intervention occurred too late to allow vaccination. During 2006, the Mobile Laboratory was used to conduct an emergency carriage study that for the first time occurred during the peak of a meningococcal serogroup A epidemic. This information is critical for the design of meningococcal conjugate vaccine schedules and vaccine approaches. During 2004-6, technicians in 11 district laboratories received training by Mobile Laboratory staff. Numerous problems with the initial prototype laboratory were identified, namely that the solar power cells could not provide enough energy to the refrigerator and incubator to maintain appropriate temperatures and having a single integrated unit required use of a separate vehicle for specimen transport. A second laboratory was developed during 2005-6 that used a generator or local energy source for power and that had a laboratory that could be detached from the vehicle. Currently the main limitation of the Mobile Laboratory is that it has not been integrated into routine Ministry of Health activities, limiting its use both during and between meningitis seasons.

#### **Introduction**

Until recently, acute bacterial meningitis epidemics in Sub-Saharan Africa were assumed to be due to *Neisseria meningitidis* (Nm) of serogroup A and epidemic response consisted of vaccination with bivalent A/C vaccine. The recent occurrence of epidemics due to Nm W135 and the availability of a limited supply of trivalent A/C/W135 polysaccharide (PS) vaccine have created a need for timely Nm serogroup information to tailor vaccine response to the needs of specific districts or regions (1-3). In Burkina Faso, the identification of agents of acute bacterial meningitis usually relies on reference hospital laboratories. These laboratories, however, cover only 30-40% of reported cases and meningitis epidemiology might differ considerably in more rural or remote areas. In addition to low surveillance coverage, countries like Burkina Faso often encounter shortages of reagents and consumable laboratory supplies. Lastly, developing countries have training needs for laboratory technicians as most technicians working in peripheral laboratories receive little formal training. To address these issues, AMP and the Burkina Faso Ministry of Health implemented a mobile laboratory designed to strengthen Ministry of Health capabilities to confirm bacterial meningitis etiology during epidemics, particularly in remote areas.

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## Mobile Laboratory Design

### Mobile Laboratory 1



**Figure 1: Mobile Laboratory Prototype 1.** Note that the unit is one piece and contains solar panels

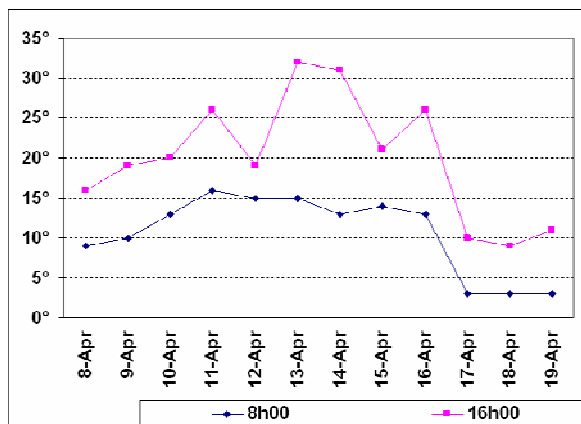
During 2003, AMP conceived, designed, and tested in the field a vehicle with microbiological laboratory facilities (Figure 1). The laboratory unit was developed as a modified, commercial four-wheel drive van (Renault “Kangoo” 4x4 diesel). Outfitting was performed by the University of Münster, Germany. The Mobile Laboratory was outfitted for performance of routine microbiology to allow provision of immediate feedback to local medical staff and District and National Ministry of Health decision-makers. It also had the capacity to transport specimens back to a reference laboratory in Bobo-Dioulasso or Ouagadougou for further analysis.

To allow these functions, the Mobile Laboratory was air-conditioned and outfitted with a refrigerator, hot plate, incubator, sink, microscope, and centrifuge (Figure 2). Electricity was provided by solar panels on the vehicle’s roof (Figure 2). The refrigerator was installed for storage of reagents. The sink was installed to allow performance of Gram staining. The microscope allowed evaluation of Gram stain slides and determination of cerebrospinal fluid white blood cell count. The incubator was set at 37°C and with an appropriate CO<sub>2</sub> concentration for bacterial culture.

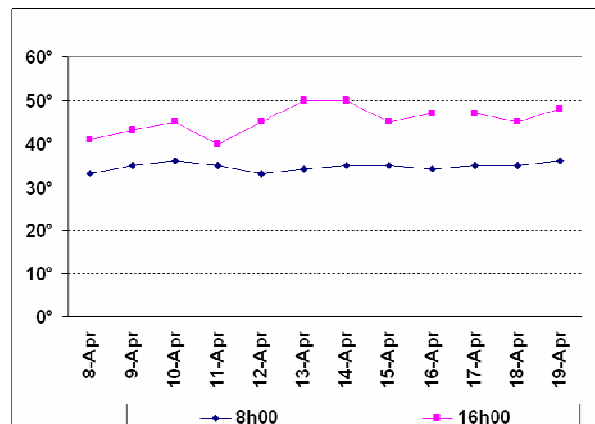


**Figure 2: Interior of Mobile Laboratory 1**

During actual implementation, several issues arose. The solar panels on the unit did not provide sufficient electricity to maintain the temperature of the refrigerator (Figure 3) and the incubator (Figure 4) during the evening and night. The air conditioner of the selected vehicle did not perform well under field conditions. Having the laboratory integrated into the vehicle meant that a separate vehicle was required to transport specimens and culture back to the reference laboratory. Lastly, the space available for laboratory technicians was not sufficient for optimal work.



**Figure 3: Refrigerator temperature of the Mobile Laboratory 1 during field conditions in Burkina Faso, 2004**



**Figure 4: Incubator temperature of the Mobile Laboratory 1 during field conditions in Burkina Faso, 2004**

### Mobile Laboratory 2

The Mobile Laboratory 2 was based on a Toyota Hilux 4x4, air-conditioned diesel vehicle (Figures 5 and 6). We employed a detachable body that could remain on site, leaving the vehicle free to continue activities requiring mobility. The detachable body also fully isolates the driver's cabin from the laboratory facilities, possibly decreasing the risk of contamination of specimens and increasing the safety of the driver and passengers. We employed fixed electricity rather than solar panels, using a 2500 watt Honda diesel generator. Wiring allows for both 230V and 12V electricity. The incubator is a Binder GmbH CO2 incubator (Tuttlingen, Germany), which has a capacity of approximately 56 90mm plates. Water is supplied via a 20 liter canister with a similar 20 liter canister for wastewater.



Figure 5: Mobile Laboratory 2. Note the lack of fixed solar panels and the detachable laboratory unit



Figure 6: Interior of Mobile Laboratory 2.

## **Methods**

### Mobile Laboratory 1 and Outbreak Response

The Mobile Laboratory was sent to three remote districts during 2004 that were experiencing epidemics. Once on site, Mobile Laboratory staff received cerebrospinal fluid (CSF) specimens collected by local health facility personnel from suspected bacterial meningitis cases based on the WHO case definition (4). The Mobile Laboratory staff then performed Gram staining, cytology, culture on chocolate agar and latex agglutination tests (Pastorex®). In addition to the Mobile Laboratory staff, two MOH technicians under the supervision of an MOH biologist accompanied the laboratory to the field. A microbiologist from the Marseille-Pharo (France) WHO collaborating reference laboratory provided training for the technicians.

Antibiotic resistance was determined in a reference laboratory using the disk-diffusion technique and measurement of minimal inhibitory concentrations by E-test (Solna, Sweden) (5). One aliquot of CSF for each case was shipped to Centre Muraz (Bobo-Dioulasso) for polymerase chain reaction (PCR) testing as previously described (3). Available results were provided immediately to the patient's physician. A case was confirmed if latex agglutination, culture, or PCR yielded a positive result. External quality control was performed at the National Reference Laboratory in Ouagadougou.

### Mobile Laboratory 2 and Technical Assistance

Based on the use of the first prototype, a second Mobile Laboratory was built and placed in the field during 2005 and 2006. The Mobile Laboratory was not used for epidemic evaluation during this period. However, we describe here its use during a carriage study conducted in a rural area experiencing an epidemic and its use for the training of technicians in five district laboratories.

### Ethical issues

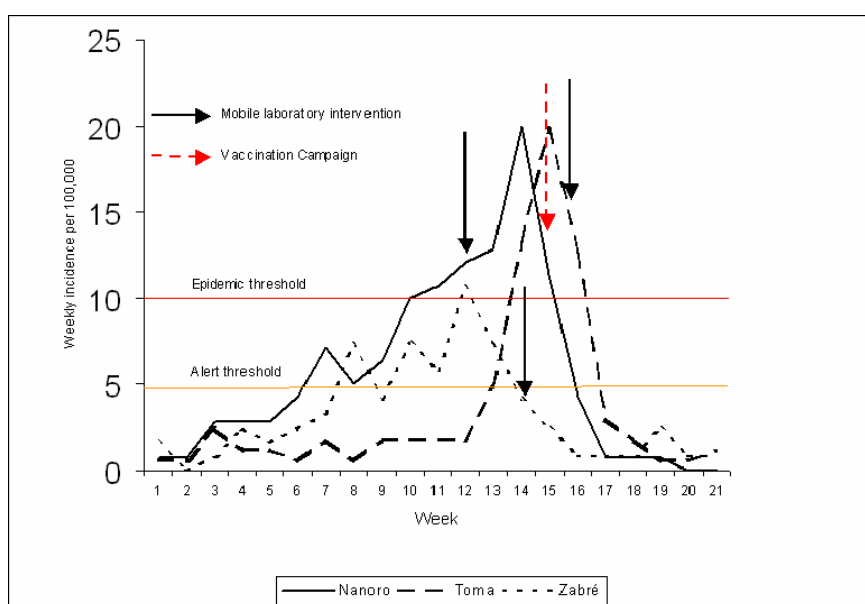
The Mobile Laboratory was used as part of the routine MOH emergency epidemic response. All tests performed were clinically indicated or were part of the MOH epidemic surveillance system. Under these circumstances of routine clinical management and public health surveillance, informed consent and institutional review board approval were neither sought nor obtained.

## Results

### Mobile Laboratory 1 and Outbreak Response

#### *Mobile Laboratory activities*

The Mobile Laboratory 1 was provided to the Burkina Faso Ministry of Health to intervene in districts in alert or epidemic for suspected acute bacterial meningitis. During 2004, three remote districts with poor access to laboratory facilities reported acute bacterial meningitis epidemics and were considered appropriate sites for the Mobile Laboratory. Nanoro passed the alert threshold during week 7 of the epidemic season and the epidemic threshold during week 12, and the Mobile Laboratory 1 intervened during week 14 (Figure 7). In Zabré, these events occurred during weeks 10, 12, and 14 and in Toma weeks 13, 14, and 16. The weekly reported incidences of suspected cases of acute bacterial meningitis in Nanoro, Zabré, and Toma the week before the intervention were 11, 7.4 and 20 per 100,000 inhabitants. No collection and evaluation of CSF specimens was performed and reported before the Mobile Laboratory interventions. In general, clinical staff reported cases based on standard clinical criteria for suspected acute bacterial meningitis, but we did not have a mechanism for determining if this always occurred.



**Figure 7: Weekly number of suspected cases of acute bacterial meningitis in Nanoro, Zabré and Toma, 2004**

Cerebrospinal fluid specimens from 58 suspected cases were evaluated including from Nanoro (n=19), Zabré (n=26), and Toma (n=13) (median age, 2.5 years; 58% <5 years). Of these cases, 23 (40%) had a confirmed bacterial etiology (median age, 9.0 years; 43% <5 years). Etiology differed by location with eight NmW135 and five *Streptococcus pneumoniae* (Sp) in Nanoro, three NmA and one Sp in Zabré, and five NmW135 and one Y/W135 (identified by latex agglutination) in Toma. Meningococcal meningitis with coma and all pneumococcal meningitis were treated with multi-day courses of intravenous ampicillin; the remaining Nm cases were treated with a single intramuscular dose of oily chloramphenicol. Of 10 Nm and three Sp tested, all were sensitive to chloramphenicol, oxacillin and ceftriaxone.

#### *Vaccine interventions related to the Mobile Laboratory 1 intervention*

Before the Mobile Laboratory intervention, no specimens had been collected and analyzed from Nanoro and vaccination was delayed. Following the Mobile Laboratory confirmation of a meningococcal epidemic, and documentation of NmW135 as the primary agent, Nanoro residents aged 2-29 years received mass vaccination with trivalent Nm A/C/W135 polysaccharide vaccine during week 15 (post-epidemic, the Burkina Faso Ministry of Health at two international meetings affirmed that the vaccine response was prompted by results from the Mobile Laboratory intervention). A total of 112,421 doses were administered during April 3<sup>rd</sup> to 8<sup>th</sup> for an administrative vaccine coverage of 113% in the target population (Source: Burkina Faso Ministry of Health). No vaccine responses were organised in Zabré or Toma. In both districts, results were obtained after case counts had begun decreasing and in Zabré an A/C vaccination campaign had been conducted the previous year.

#### *Cost of the Mobile Laboratory 1 intervention*

We performed an assessment of the cost of the Mobile Laboratory for the intervention period. The Mobile Laboratory unit itself cost \$44,200, including the cost of the vehicle (\$23,300) and fixed equipment (\$20,900). The total intervention period was 2 months with 25 actual days in the field. Operational costs for this period were estimated at \$44,200 including \$13,800 for staff and fuel, \$6,800 for use of a separate car by accompanying Ministry of Health staff, \$8,900 for consumable reagents and other laboratory supplies, \$6,400 for reference laboratory costs (supplies and wages), and \$8300 for miscellaneous costs. The total cost associated with intervening in the three districts was \$88,400, of which half were fixed costs that would not be repeated until the unit or equipment required repair or replacement.

#### Mobile Laboratory Use During an Emergency Carriage Study

Meningococcal conjugate vaccines will be available during the next few years for preventive vaccination of the population of the meningitis belt. However, optimal immunization schedules and approaches (such as infant immunization, mass vaccination, catch-up campaigns, and booster doses) have not been defined. One of the primary missing pieces of data has been the degree of meningococcal carriage during an epidemic. These data are difficult to collect because of the unpredictable location and timing and frequent short duration of meningococcal epidemics in combination with the logistical difficulties of implementing a carriage study rapidly in impoverished and poorly accessible areas and before the implementation of an emergency vaccine campaign (which may alter results).

In February 2006, AMP and Centre Muraz (with funding from Sanofi-Pasteur) were notified of a meningococcal serogroup A epidemic in the Hauts-Bassins region of Burkina Faso. The study team was able to organize and implement, within two weeks of notification, an evaluation of Nm and Sp carriage and seroprevalence in three villages located 60 kilometres from Bobo-Dioulasso. The two Mobile Laboratories performed initial processing of blood samples for serological analysis, including centrifugation and serum aliquoting. The Mobile Laboratories also performed initial microbiological processing of nasal swabs, including plate streaking and incubation and preparation of swab suspensions. The Mobile Laboratories allowed processing of up to 110 specimens per day and eventual collection of the entire planned sample size of 624. Quality control of all equipment, including monitoring of the refrigerator and incubator temperatures, was performed during the study and no deficiencies were found. In addition, cerebrospinal fluid samples from meningitis cases during the carriage study period could be prepared for culture analyses in the Mobile Laboratories.

#### Mobile Laboratory Use for Technician Training

A secondary goal of the Mobile Laboratory is to provide ongoing and onsite training to laboratory technicians in district hospitals. During the 2004 evaluation of epidemics, technicians in the three intervention districts received training on bacteriological techniques. During May 2005, technicians in five district laboratories (Boussé, Gourcy, Manga, Pô, and Zabré) received training while during April 2006, technicians from three district laboratories (Boussé, Sapouy, and Léo) received training.

Training goals included review of storage and transport conditions of cerebrospinal fluid specimens from health posts to district laboratories, evaluation of the use of trans-isolate media, performance of quality control of Gram staining, and identification of critical issues such as reagent shortage. The Mobile Laboratory team identified three broken microscopes, lack of incubators in all laboratories, lack of latex agglutination kits (necessary for serogroup determination and thus determination of the appropriate vaccine intervention), and poor cytology technique. During 2004, five technicians received training in the Mobile Laboratory facilities followed by another five during 2005 and nine during 2006.

## **Discussion**

#### Epidemic intervention to guide vaccination

We found that the epidemiology of acute bacterial meningitis epidemics differed substantially at the district level with one of the districts experiencing an outbreak of primarily Nm A, another primarily Nm W135 and the third a mix of Nm W135 and Sp. As a direct result of these findings, the Ministry of Health implemented trivalent A/C/W135 vaccine in Nanoro. In the absence of results from the Mobile Laboratory, a greater delay would have existed between notification of the epidemic, confirmation of etiology, and vaccine response. In addition, some districts do not have adequate supplies or personnel to determine etiologic agents of disease during epidemics, potentially leading to use of an inappropriate vaccine or no vaccine response at all.

The primary goal of the Mobile Laboratory is to provide information to allow appropriate epidemic response, including the need for and type of vaccine. During the first year of implementation, this goal met with partial success. Nanoro received trivalent A/C/W135 vaccine when they otherwise would have received bivalent A/C vaccine; nevertheless, the intervention occurred after the epidemic was subsiding. In Zabré and Toma results were obtained after the epidemic had begun to subside and thus no vaccination response was implemented. These circumstances resulted partly from delays associated with implementing a new technology, such as staffing, training, and equipping the vehicle, and partly from having only one vehicle available. In addition, the Mobile Laboratory did not have the level of political support and integration into routine Ministry of Health activities that would allow for optimal use. In the future, the Mobile Laboratory should be prepared well in advance of the epidemic season and sent to the field when the alert rather than the epidemic threshold is passed, activities that are more likely with political support from the Ministry of Health.

#### Additional Mobile Laboratory Benefits

In addition to directing epidemic vaccine response, the Mobile Laboratory provides additional benefits. First, standard clinically-based case management strategies during the epidemic season call for treatment with one or two doses of oily chloramphenicol (6). Because this treatment is potentially inadequate for pneumococcal and *Haemophilus influenzae* type b meningitis, immediate provision of results to clinicians coupled with the availability of systemic ampicillin or ceftriaxone may improve clinical outcome (7). Second, the Mobile Laboratory provides data on disease epidemiology in relatively remote districts. Our data, collected over a relatively short period in each District, suggest that the importance of various etiologic agents of disease changes over relatively short geographic areas and that Sp plays a substantial role in some areas. Third, Mobile Laboratory staff trained 19 local technicians, who then provided ongoing data during the course of the epidemic. This is of particular importance in countries where rural and other MOH laboratory staff often receive little formal training. In theory, training does not need to rely on the existence of a Mobile Laboratory. However, the Mobile Laboratory creates efficiencies by conducting training at the same time as it assists with outbreak evaluation, allows technicians to receive training during an actual epidemic, and ensures that necessary equipment for training is available. Fourth, the Mobile Laboratory can be used to assess reagent stocks during an epidemic and to assist with replenishing them. Finally, the Mobile Laboratory was a critical tool in the successful implementation of a carriage study during the peak of a meningococcal serogroup A epidemic. This information will allow the development of models of how to use conjugate meningococcal vaccines and could not have been collected without the Mobile Laboratory. In general, Mobile Laboratory technology may be useful for research by allowing studies during epidemics and in rural areas that otherwise do not have adequate laboratory facilities to process biological specimens.

#### Mobile Laboratory Cost

The Mobile Laboratory allows the MOH to direct resources specifically to areas in epidemic without requiring that the entire country have adequate local diagnostic capability. Thus, the \$88,400 cost of the Mobile Laboratory must be balanced against the costs of strengthening and maintaining all district level laboratories in the country. For example, just the costs of purchasing 100 latex agglutination test kits per year for each of the approximately 55 districts in Burkina Faso will cost \$82,500 based on a test price of \$15. Because of the short shelf life of latex agglutination kits, this cost would be repeated each year. Also, this cost does not include staff, training, quality control, antibiotic resistance testing, and other costs included in the Mobile Laboratory cost estimate. Other cost issues need to be taken into account. Each Mobile Laboratory can only intervene in one district per week, a clear limitation when multiple districts simultaneously pass the alert or epidemic threshold. Ideally, any particular country would maintain a fleet of Mobile Laboratories sufficient for most epidemic seasons. Also, once a Mobile Laboratory is purchased, and assuming it is well adapted to field conditions in Africa, costs will be limited to the operational costs of the intervention (approximately \$44,200 for three interventions) and system maintenance.

#### Fixed Versus Mobile Laboratories

In theory, the Mobile Laboratory should not be needed because district laboratories could perform all needed functions. In practice, though, this is unlikely to occur in the near future. Laboratories in some areas are not considered part of the Ministry of Health structure and thus may have no fixed budget. There are an inadequate number of trained microbiologists and technicians to staff all district laboratories and lack of money for bringing staff to a central location for ongoing training. Finally, there is no manufacturing capacity in Africa for low-cost reagents adapted to conditions in the meningitis belt. Consequently, tests such as latex agglutination are expensive (in excess of US \$10 per test) and frequently in short supply, past their expiration date, or poorly implemented. Because of these limitations, the epidemic response system used in much of the meningitis belt relies on shipment of cerebrospinal fluid specimens from district to central laboratories. This process, however, is limited by the lack of transport media and vehicles for transportation. In Burkina Faso, for example, during

2003 only an estimated 40% of districts in alert or epidemic sent the minimum required 15 CSF specimens. When specimens did arrive, 32% were contaminated (Burkina Faso MOH, unpublished data, 2003).

### Conclusions and Future Directions

This report demonstrates that in meningitis belt countries lacking adequate resources for nationwide laboratory improvement, the Mobile Laboratory can be successfully implemented to guide vaccine intervention and clinical management, expand knowledge of meningitis epidemiology and conduct studies in rural areas, and provide training to local technicians. Nevertheless, the impact of the Mobile Laboratory was not ideal. Future improvements should include costing, budgeting and programming the integration of the Mobile Laboratory into the national surveillance system to facilitate intervention when the alert rather than the epidemic threshold is passed. This integration may require a critical number of vehicles rather than just the two vehicles currently existing. This also would allow intervention in multiple districts simultaneously. The efficiency and benefit of the Mobile Laboratories could be improved as well by using them outside of the epidemic meningitis season for other activities such as use during the rainy season for evaluation of diarrheal disease outbreaks and epidemiology.

### References

1. Taha MK, Parent du Chatelet I, Schlumberger M, Sanou I, Djibo S, De Chabalier F, Alonso JM. *Neisseria meningitidis* serogroups W135 and A were equally prevalent among meningitis cases occurring at the end of the 2001 epidemics in Burkina Faso and Niger. *J Clin Microbiol* **2002**; 40:1083-4.
2. Weekly Epidemiological Record. Detecting meningococcal meningitis epidemics in highly endemic African countries. *Weekly Epidemiological Record* **2000**; 75:306-10.
3. Parent du Chatelet I, Traore Y, Gessner BD, Antignac A, Naccro B, Njanpop-Lafourcade BM, Ouedraogo MS, Tiendrebeogo SR, Varon E, Taha. Bacterial meningitis in Burkina Faso: surveillance using field-based polymerase chain reaction testing. *Clin Infect Dis* **2005**; 40:17-25.
4. World Health Organization. Recommended surveillance standards (second edition). WHO/CDS/CSR/ISR/99.2. Geneva: World Health Organization, **1999**.
5. Vazquez JA, Arreaza L, Block C, et al. Interlaboratory comparison of agar dilution and Etest methods for determining the MICs of antibiotics used in management of *Neisseria meningitidis* infections. *Antimicrob Agents Chemother* **2003**; 47:3430-34.
6. World Health Organisation. Meningococcal meningitis. Fact sheet number 141. Revised May **2003**. Available at: <http://www.who.int/mediacentre/factsheets/fs141/en/>. Accessed 7 March 2005.
7. World Health Organization. Antimicrobial and support therapy for bacterial meningitis in children: report of the meeting of 18-20 June 1997, Geneva, Switzerland. WHO/EMC/BAC/98.6. Geneva: World Health Organization, **1998**.
8. Hussey G, Hitchcock J, Hanslo D, Schaaf S, Klugman K, Coetzee G. Epidemiology, antimicrobial resistance patterns and serotype distribution of *Streptococcus pneumoniae* infections in Cape Town children. Annual Research Day, Department of Paediatrics and Child Health, University of Cape Town, **1996**.
9. Friedland IR, Klugman KP. Failure of chloramphenicol therapy in penicillin-resistant pneumococcal meningitis. *Lancet* **1992**; 339:405-8.
10. Muhe L, Klugman KP. Pneumococcal and *Haemophilus influenzae* meningitis in a children's hospital in Ethiopia: serotypes and susceptibility patterns. *Trop Med Int Health* **1999**; 4:421-7.