Sustainable investment in research for health

MEETING REPORT

29 June, 2014 Berlin, Germany







West African Health Organization Organisation Ouest Africaine de la Santé



Sustainable investment in research for health - meeting report

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KEY WORDS

innovative financing; research for health; national research for health systems; low-and middle-income countries

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Executive Summary

OVER THE LAST DECADE, VARIOUS DECLARATIONS HAVE CALLED FOR GREATER INVESTMENT IN RESEARCH FOR HEALTH BY LOW- AND MIDDLE-INCOME COUNTRIES (LMICS). However, recent analyses have shown that African countries still rely heavily on external donors and partnerships to fund local research. The result is that health systems and health research and innovation capacities in LMICs remain under-developed and capacity to translate research into products, services or technologies is less of a priority. The challenge is for these countries to negotiate allocation of existing resources for their research and system needs and priorities, and to improve these financial flows for more impact. This includes creating an environment that is conducive to conducting research, promoting innovation, creating partnerships and attracting investments.

It has become increasingly clear that new financing mechanisms are needed to meet the growing health burden through investing in research and development (R&D). Innovative financing mechanisms are novel sources or applications of funding research and development that expand on or supplement traditional funding mechanisms such as donor funding or development aid. These mechanisms have the potential to either mobilise new revenue or improve the use of existing funds.

On 29 June 2014, COHRED, in partnership with the West African Health Organisation (WAHO) and the New Partnership for Africa's Development (NEPAD) Agency, held a meeting on sustainable investment in research for health. This one-day meeting was held in Berlin as a satellite meeting to the seventh EDCTP Forum and was attended by 35 participants from a number of different

high income and low-and middle-income countries and organisations.

The objective of this meeting was to review mechanisms for mobilising funds or allocating existing funds more effectively and to assess the relevance and feasibility of applying such mechanisms in low resource contexts. However, it soon became evident that the priority for participants was to focus on the systems within which this financing takes place. Discussions centred on bottlenecks and possibilities in the research for health system that could either hinder or promote investments in research for health. This supports the perspective that, in order to mobilise funds towards research for health, systems need to be in place that can maximise those funds. It recognises that creating an enabling environment which stimulates and supports research and innovation is critical to the success of any initiative that seeks to mobilise or channel funds towards research for health.

Through open space facilitation, participants identified four key topics for discussion during the meeting. These were:

- 1. Developing an integrated system for innovation,
- 2. Shifting from the notion of "funding" to "investment",
- 3. Creating an African research space, and
- 4. Engaging in advocacy for research for health financing.

After a brief background regarding the need for sustainable financing mechanisms for research for health, this report provides a detailed discussion of the four key topics identified by meeting participants. Following this, an overview of innovative financing mechanisms is presented. Recommendations are made for taking steps towards developing integrated innovation systems, shifting from funding to investment, creating an African research space and engaging in advocacy for research for health financing.

RECOMMENDATIONS

Develop an integrated system for innovation

Bottlenecks in the system can hinder the effective use of available funds or the mobilisation of additional funds for research and innovation. In addition to strengthening key elements of the system, participants highlighted a number of steps that could increase the attractiveness of investing in research:

- Make an economic case for research by linking research to cost-effectiveness and return-oninvestment studies.
- Foster political will and interest through understanding what priorities governments have and showing how research can respond to these.
- Show the actual investments made in research to demonstrate tangible return on investment.
- Increase cross-sectoral research collaboration to make research more efficient and sustainable.

Shift from a funding to an investment perspective

Shifting thinking about research funding to research investment implies finding ways to be proactive and expecting returns on investment in the form of impacts, outcomes and financial or other gains. Participants explored how to make this paradigm shift and suggested the following:

- Show the impact of research on GDP to demonstrate the (economic) value of research in its own right.
- Track research through open data systems to show impact and return on investment.
- Create integrated research and innovation platforms to make efficient use of existing resources and thereby incentivise investment.
- Strengthen accountability and transparency to attract potential investors through strong financial and administrative systems.

Create an African research space

Recognising the fragmentation of research in Africa, and expanding on the potential of collaborative research to attract investment, recommendations were made for how this could be maximised through establishing an African research space. Creating this African research space could involve steps to:

- Map the landscape to understand what is already in place and how it can be utilised or improved.
- Harmonise stewardship through tapping into regional leadership bodies and establishing common regulation processes and research agendas.
- Engage all stakeholders through open dialogue and continuous feedback, both during the creation of this space and its operation.
- Secure consistent funding by identifying a range of funding mechanisms to ensure sustainability of the research space.
- Leverage Africa's potential by creating a strong cohesive whole to stimulate innovation and give it an equal place at the global table.

Engage in advocacy

Advocating for sustainable investments in research for health was considered critical to move from declarations about the importance of such investments, to action. Investors – from governments to private sectors – could be convinced of the case for research for health financing through a number of advocacy efforts:

- Establish a regional peer-review mechanism to incentivise follow up of key declarations, using a defined set of indicators.
- Engage the media as an advocate by maximising opportunities to communicate research findings through research-savvy journalists and mediasavvy researchers.
- Create a scientific culture through early education to increase buy-in to the value of research in the community.
- Widen the scope of the audience to include, for example, other ministries and stakeholders.

Résumé et recommandations

Note de synthèse

AU COURS DES DIX DERNIÈRES ANNÉES, DE NOMBREUSES DÉCLARATIONS ONT APPELÉ LES PAYS À REVENU FAIBLE ET INTERMÉDIAIRE (PRFI) À INTENSIFIER LEURS INVESTISSEMENTS DANS LA RECHERCHE EN SANTÉ. Cependant, des études récentes ont démontré que les pays africains s'appuient encore largement sur les partenariats et les donateurs extérieurs pour financer la recherche à l'échelle locale. En conséquence, les systèmes de santé et les capacités en matière de recherche et d'innovation dans le domaine de la santé demeurent sousdéveloppés dans les PRFI. En outre, la capacité à convertir les résultats des recherches en produits, en services ou en technologies constitue une moindre priorité pour ces pays. Ces derniers se retrouvent donc confrontés aux défis suivants : d'une part, ils doivent négocier l'affectation de ressources existantes pour les besoins et priorités de leurs activités de recherche et de leurs systèmes et, d'autre part, améliorer ces flux financiers pour en renforcer l'impact. Cela implique notamment de créer un environnement propice à la recherche, à la promotion de l'innovation, à l'établissement de partenariats et aux investissements.

Il est de plus en plus manifeste que de nouveaux mécanismes de financement s'avèrent nécessaires pour alléger le fardeau toujours plus pesant de la santé via des investissements dans la recherche et le développement (R&D). Les mécanismes de financement novateurs sont des sources ou des applications originales de financement pour la recherche et le développement qui viennent renforcer ou compléter les mécanismes de financement traditionnels, comme la mise à disposition de fonds par des donateurs ou l'aide au développement. Ces mécanismes sont susceptibles de mobiliser de nouveaux revenus ou d'améliorer l'utilisation des fonds existants.

Le 29 juin 2014, en partenariat avec l'Organisation Ouest Africaine de la Santé (OOAS) et le Nouveau Partenariat pour le Développement de l'Afrique (NEPAD), le COHRED a organisé une rencontre sur le thème des investissements durables dans la recherche en santé. Cette rencontre d'un jour s'est déroulée à Berlin, en marge du septième Forum EDCTP, et a rassemblé 35 participants, issus de différents pays à revenu élevé, intermédiaire ou faible et de différentes organisations.

L'objectif de cette réunion était de passer en revue les mécanismes permettant de mobiliser des fonds ou d'allouer les fonds existants de façon plus efficace et d'évaluer la pertinence et la faisabilité de l'application de tels mécanismes dans des contextes à faibles ressources. Toutefois, il est vite apparu que les participants souhaitaient en priorité se concentrer sur les systèmes dans le cadre desquels ces financements sont accordés. Les discussions ont surtout porté sur les obstacles et les possibilités dans le système de recherche en santé qui pourraient entraver ou promouvoir les investissements dans la recherche en santé. Cette approche appuie l'idée selon laquelle, pour mobiliser des fonds en faveur de la recherche en santé, il est nécessaire de mettre en place des systèmes permettant de maximiser ces fonds. Elle reconnaît que l'instauration d'un environnement propice, qui stimule et alimente la recherche et l'innovation, est essentielle pour assurer la réussite de toute initiative visant à mobiliser et à canaliser des fonds pour la recherche dans le domaine de la santé.

La mise en place d'un Forum Ouvert a permis aux participants de définir quatre thèmes clés pour orienter les discussions pendant la rencontre :

- 1. développer un système intégré en faveur de l'innovation ;
- passer de la notion de « financement » à celle d' « investissement » ;
- 3. créer un espace de recherche africain ;
- engager des actions de plaidoyer en faveur du financement de la recherche en santé.

Le rapport commence par un bref aperçu expliquant la nécessité de mécanismes de financement durables pour la recherche en santé. Il fournit ensuite une présentation détaillée des discussions organisées autour des quatre thèmes clés définis par les participants à la réunion. Il offre par la suite une vue d'ensemble de différents mécanismes de financement innovants. Enfin, ce rapport formule des recommandations concernant les mesures à prendre en vue de développer des systèmes d'innovation intégrés, de passer de la notion de « financement » à celle d'« investissement », de créer un espace de recherche africain et d'engager des actions de plaidoyer en faveur du financement de la recherche en santé.

RECOMMANDATIONS

Développer un système intégré en faveur de l'innovation

Les obstacles dans le système peuvent entraver l'utilisation efficace des fonds disponibles ou la mobilisation de fonds supplémentaires pour la recherche et l'innovation. Outre le renforcement d'éléments clés du système, les participants ont mis en évidence un certain nombre de mesures susceptibles d'améliorer l'attractivité des investissements dans la recherche :

- exposer les arguments économiques en faveur de la recherche en établissant un lien entre la recherche et la rentabilité, ainsi que le retour sur investissement des études ;
- susciter l'intérêt et la volonté politiques en comprenant les priorités des gouvernements et en montrant comment la recherche peut y répondre ;
- présenter les investissements réalisés dans la recherche, afin de démontrer le retour sur investissement réel généré ;
- intensifier les collaborations intersectorielles en matière de recherche, afin de renforcer l'efficacité et le caractère durable de la recherche.

Passer d'une perspective de financement à une perspective d'investissement

Pour changer les mentalités et passer de la notion de financement de la recherche à celle d'investissement dans la recherche, il faut adopter une attitude proactive et prévoir un retour sur investissement, notamment sous la forme d'impacts, de résultats et de gains financiers ou autres. Les participants ont exploré différentes pistes pour susciter ce changement de paradigme et ont formulé les propositions suivantes :

- montrer l'impact de la recherche sur le PIB, afin de prouver la valeur (économique) de la recherche en tant que secteur d'activité ;
- assurer le suivi des travaux de recherche via des systèmes de données ouverts, afin de montrer l'impact de ces recherches et le retour sur investissement qui en découle;
- créer des plateformes intégrées de recherche et d'innovation, afin d'utiliser efficacement les ressources existantes et d'encourager ainsi les investissements;
- renforcer la responsabilité et la transparence, afin d'attirer des investisseurs potentiels grâce à des systèmes financiers et administratifs solides.

Créer un espace de recherche africain

Compte tenu de la fragmentation de la recherche en Afrique et en vue de tirer parti du potentiel de la recherche collaborative pour attirer les investissements, plusieurs recommandations ont été formulées pour déterminer la façon dont ces investissements pourraient être maximisés grâce à l'instauration d'un espace de recherche africain. La création de cet espace de recherche africain pourrait comprendre des mesures visant à :

- cartographier la situation, afin de comprendre quels éléments sont déjà en place et comment ils pourraient être exploités ou améliorés ;
- harmoniser la gestion en ayant recours aux instances dirigeantes régionales et en définissant des processus de réglementation et des programmes de recherche communs;
- associer tous les acteurs, via un dialogue ouvert et un feedback continu, tant lors de la création de cet espace que par la suite, lorsqu'il sera fonctionnel;
- obtenir des financements réguliers en identifiant une série de mécanismes de financement pour garantir la durabilité de l'espace de recherche;
- mettre à profit le potentiel de l'Afrique en créant un ensemble cohésif solide pour stimuler l'innovation et en lui ménageant une place à part entière sur la scène internationale.

Engager des actions de plaidoyer

Le plaidoyer en faveur d'investissements durables dans la recherche en santé est perçu comme un élément fondamental pour transformer les déclarations relatives à l'importance de tels investissements en actions concrètes. Différentes activités de plaidoyer pourraient convaincre les investisseurs – privés comme publics – de l'intérêt de financer la recherche dans le domaine de la santé :

- établir un mécanisme régional d'examen par des pairs, afin de favoriser le suivi des déclarations clés, au moyen d'un ensemble d'indicateurs préalablement défini ;
- mobiliser les médias pour témoigner en faveur de la recherche en maximisant les possibilités de communiquer les résultats de travaux de recherche par l'intermédiaire de journalistes spécialisés dans ce domaine et de chercheurs familiarisés avec les médias ;
- créer une culture scientifique via l'éducation de la petite enfance sensibiliser davantage à l'importance de la recherche au sein de la communauté ;
- élargir le public visé pour y inclure d'autres ministères et parties prenantes, par exemple.

Resumo e recomendações

Resumo executivo

DURANTE A ÚLTIMA DÉCADA FORAM FEITAS VÁRIAS DECLARAÇÕES A APELAR A UM MAIOR INVESTIMENTO NA INVESTIGAÇÃO PARA A SAÚDE POR PARTE DE PAÍSES DE BAIXO E MÉDIO RENDIMENTO (PBMR). Contudo, análises recentes revelaram que os países africanos ainda dependem fortemente de doadores externos e de parcerias para financiar a investigação local. O resultado é que os sistemas de saúde e as capacidades em termos de investigação para a saúde e de inovação nos PBMR continuam pouco desenvolvidos e a capacidade para transformar a investigação em produtos, serviços ou tecnologias constitui uma prioridade menor. Estes países têm pela frente o desafio de negociar a afetação dos recursos existentes para a sua investigação e necessidades do sistema e prioridades, melhorando estes fluxos financeiros para obter mais impacto. Tal inclui criar um ambiente propício à realização de investigação, à promoção da inovação, à criação de parcerias e à atração de investimentos.

Tornou-se cada vez mais evidente que são necessários novos mecanismos de financiamento para satisfazer os encargos crescentes com a saúde, através do investimento na investigação e desenvolvimento (I&D). Os mecanismos inovadores de financiamento são fontes ou aplicações novas para financiar a investigação e desenvolvimento, que alargam ou suplementam os mecanismos tradicionais de financiamento, como os fundos de doadores ou a ajuda ao desenvolvimento. Estes mecanismos têm potencial quer para mobilizar novas receitas, quer para melhorar a utilização dos fundos existentes.

Em 29 de junho de 2014, o COHRED, em parceria com a Organização Oeste Africana da Saúde (OOAS) e a Agência da Nova Parceria para o Desenvolvimento de África (NEPAD), realizaram uma reunião sobre o investimento sustentável para a saúde. Esta reunião de um dia realizou-se em Berlim, como encontro satélite do 7º Fórum EDCTP, tendo estado presentes 35 participantes provenientes de uma série de organizações e países de baixo e médio rendimento.

O objetivo desta reunião era rever os mecanismos de mobilização de fundos ou de afetação dos fundos existentes de forma mais eficaz e avaliar a importância e a exequibilidade da aplicação desses mecanismos em contextos de baixos recursos. Contudo, depressa se tornou evidente que a prioridade para os participantes era focaremse nos sistemas em que estes financiamentos ocorrem. As discussões centraram-se nos estrangulamentos e nas possibilidades do sistema de investigação para a saúde que pudessem dificultar ou promover investimentos nesta área de investigação. Isto sustenta a ideia de que, para mobilizar fundos para a investigação para a saúde, é preciso que existam sistemas que possam maximizar esses fundos. Reconhece que a criação de um ambiente favorável que estimule e apoie a investigação e a inovação é fundamental para o êxito de qualquer iniciativa que se pretenda mobilizar para canalizar fundos para a investigação para a saúde.

Através de um debate aberto, os participantes identificaram quatro temas-chave para discutir durante a reunião:

- 1. Desenvolver um sistema integrado de inovação,
- 2. Mudar da ideia de "financiamento" para a de "investimento",
- 3. Criar um espaço de investigação africano e
- 4. Empenhar-se na defesa do financiamento da investigação para a saúde.

Após um pequeno historial relativo à necessidade de mecanismos de financiamento sustentáveis para a investigação para a saúde, o presente relatório oferece uma discussão pormenorizada dos quatro temas-chave identificados pelos participantes na reunião. A seguir é apresentada uma panorâmica de mecanismos de financiamento inovadores. São feitas recomendações para dar passos no sentido de desenvolver sistemas integrados de inovação, mudando do financiamento para o investimento, criando um espaço de investigação africano e envolvendo-se na promoção do financiamento da investigação para a saúde.

RECOMENDAÇÕES

Desenvolver um sistema integrado de inovação

A existência de estrangulamentos no sistema pode prejudicar a utilização eficaz dos fundos disponíveis ou a mobilização de fundos adicionais para a investigação e inovação. Para além do reforço dos principais elementos do sistema, os participantes salientaram uma série de passos que poderão aumentar a atração para investir na investigação:

- Elaborar uma argumentação económica para a investigação, ligando a investigação a estudos sobre o custo-eficácia e o retorno do investimento.
- Fomentar a vontade política e o interesse através da compreensão das prioridades dos governos e mostrando como é que a investigação pode dar resposta a essas prioridades.
- Mostrar os investimentos reais feitos na investigação para demonstrar o retorno concreto do investimento.
- Aumentar a colaboração intersetorial na investigação para a tornar mais eficiente e sustentável.

Passar de uma perspetiva de financiamento para uma de investimento

A mudança de pensamento de financiamento da investigação para investimento na investigação implica encontrar modo de ser proativo e esperar retorno dos investimentos na forma de impactos, resultados e ganhos financeiros ou outros. Os participantes analisaram como proceder a esta mudança de paradigma e sugeriram o seguinte:

- Mostrar o impacto da investigação no PIB para demonstrar o valor (económico) da investigação em si mesma.
- Rastrear a investigação através de sistemas abertos de dados para mostrar o impacto e o retorno do investimento.
- Criar plataformas integradas de investigação e inovação para utilizar de forma eficiente os recursos existentes e incentivar deste modo o investimento.
- Reforçar a responsabilização e a transparência para atrair investidores potenciais através de sistemas financeiros e administrativos sólidos.

Criar um espaço de investigação africano

Reconhecendo a fragmentação da investigação em África e alargando o potencial da investigação em colaboração para atrair investimento, foram feitas recomendações sobre como maximizá-lo através da criação de um espaço de investigação africano. A criação deste espaço de investigação africano pode envolver medidas para:

- Fazer um levantamento para perceber o que já existe e como pode ser utilizado ou melhorado.
- Harmonizar a administração através do recurso a organismos regionais de liderança e do estabelecimento de processos regulatórios comuns e agendas de investigação.
- Envolver todos os interessados num diálogo aberto e informação permanente, tanto durante a criação deste espaço como no seu funcionamento.
- Assegurar um financiamento consistente graças à identificação de uma gama de mecanismos de financiamento para garantir a sustentabilidade do espaço de investigação.
- Alavancar o potencial de África criando um todo coeso e forte para estimular a inovação e dar-lhe um estatuto de igualdade na mesa global.

Empenhar-se na respetiva promoção A

promoção de investimentos sustentáveis em investigação para a saúde foi considerada fundamental para se passar de declarações sobre a importância desses investimentos à ação. Os investidores – de governos aos setores privados – poderão ser persuadidos da bondade do financiamento da investigação para a saúde graças a uma série de esforços de sensibilização:

- Criar um mecanismo regional de revisão pelos pares para incentivar o acompanhamento das declarações principais, recorrendo a um conjunto definido de indicadores.
- Implicar os meios de comunicação social nesta promoção maximizando as oportunidades para a comunicação de conclusões da investigação através de jornalistas conhecedores da investigação e de investigadores conhecedores dos meios de comunicação social.
- Criar uma cultura científica desde a educação de base para aumentar a adesão ao valor da investigação na comunidade.
- Alargar o público destinatário a fim de incluir, por exemplo, outros ministérios e interessados.

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1. Background & rationale

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IN COHRED'S RESEARCH FOR HEALTH¹ SYSTEM STRENGTHENING APPROACH, financing is one of the three fundamental enablers of research and innovation for health. Research for health funding is a critical component underpinning national capacity to build strong research for health systems and promote research for health that responds to local needs. Financing is also an easily understood metric to measure how much research is being undertaken using the funds available, in a way that allows comparison within and between countries. By measuring financing of research and innovation for health, we can show progress, evaluate results and validate political commitments to research and innovation for health.

The 2013 World Health Report (WHO, 2013) emphasises the importance of strong research systems for better health, and calls for transparent and accountable methods for allocating funds towards this end. Although low- and middle-income country (LMIC) governments are increasingly recognising the need to move away from donor funding and to invest local funds in research and innovation, most are falling short of the recommended 2% allocation of the national health budget towards health research.

 Many LMICs do not identify investing own resources in research in general, or research for health specifically, as key to their own development. As a result, many LMICs do not have specific budget lines for research, and remain largely dependent on outside initiatives and funds when carrying out research.

- There is fragmentation and misalignment between national health/equity/development research priorities (if, indeed, these are set and communicated), on the one hand, and what is actually being researched, on the other hand, with a bias towards the priorities of external funders.
- This raises specific issues at different levels of the research and innovation system:
 - From the point of view of researchers and research institutions: they remain dependent on outside grants for serious resourcing of projects which make little, if any, provision for institution-building costs and which may terminate without continuation plans. This results in low growth potential for local research infrastructure and low retention of human resources for health research.
 - At research system level: when external funding predominates, the system becomes geared towards conditions that are fundable 'globally' – at the risk of not developing resources to deal with national health and development priorities.

^{1.} Research for health is any and all research that contributes towards the health of the population. This speaks to the inter-sectoral nature of research for health, where research in fields such as agriculture, economics, environment, science & technology, and food security can play a role in improving health. In terms of research in the health and biomedical fields, the focus extends beyond biomedical research and the development of new products to systemic aspects, such as health policy and systems research, the social determinants of health, sociobehavioural research, and operational or implementation research.

- At the national level: where research addresses donor rather than national priorities, it is difficult to grow a culture of demand for research/evidence for policy as the national research system will rarely produce such evidence for local decision making. In addition, by separating health research from national development goals, countries do not benefit from the business of research and innovation – so that research and especially health research continue to be seen as a cost to rather than as an investment in national health and development.
- And, at the international level: countries do not explicitly define areas of expertise, niches or opportunities in which local research and innovation for health can lead to international solutions, job creation and influence abroad.

As the global community increasingly recognises that allocating national funds to research and innovation is key to development, there is a corresponding increase in research documenting global and regional landscapes of research and development (R&D) policies and funding (see, for example, Hotez, Cohen, Mimura, Yamada, Hoffman & Patel, 2013; Mugabe, 2013; Røttingen et al., 2013). What is needed, now, is to move beyond the mapping of R&D investments to identify what strategies governments – and LMIC governments in particular – utilise in making these investments, and how effective strategies can be used to inform a general approach to research for health financing, from which governments can extract those strategies that are applicable to their country contexts.

2. Context

2.1. Why sustainable financing for research for health?

In 2000, the Global Forum for Health research coined the term the 10/90 gap to reflect the finding of the Commission on Health Research for Development (1990) that only 10% of health research and development (R&D) spending was devoted to the health problems of 90% of the world's population (Global Forum for Health Research, 2000; Hecht, Wilson & Palriwala, 2009). Since then, large investments have been made in global health R&D, mostly by high income countries and philanthropic organisations, with global investments showing an increase from year to year. In 2012, \$32 billion was spent on R&D for products for neglected diseases, showing a 3.2% increase in year-on-year spending (Moran et al., 2013). This forms a small percentage of the global expenditures on health-related R&D, which was estimated to be almost \$240 billion in 2009 (Rottingen et al., 2013). However, this funding is skewed towards only a few diseases and is provided by a small handful of funders (Moran et al., 2013; Wingfield, 2013), resulting in a very unbalanced picture of global health R&D investments, as shown in Figure 1 below. In addition, product-focused and disease-focused research continues to account for the biggest share of research funding (Bennett et al., 2008), with the result that the capacities and systems needed for sustainable health research in low- and middle-income countries remain under-developed.



Over the past decade, however, it has become increasingly clear that new financing mechanisms are needed to meet the growing health burden, for which "the current system for stimulating R&D has failed to deliver needed technologies, particularly for diseases that disproportionately or exclusively affect poor people" (Hotez et al., 2013, p. 3). With billions of dollars needed to address increasingly complex health needs, existing sources of funding are increasingly stretched as fiscal budgets shrink in an uncertain economic climate and the private sector grows more risk-averse (MacLean, 2012). There are a number of factors driving the need for innovative financing strategies:

- 1. The volume of R&D funding is currently insufficient,
- 2. Conventional funding streams are poorly matched with R&D processes,
- 3. With no coordination mechanism, progress in global health R&D is uneven and fragmented,
- 4. Where there is little or no market for private-sector investment, public funding and traditional donor funding have been unable to meet the need, and R&D collaborations have not been effective in leveraging more support from the private sector, and

5. Existing financing mechanisms and policies aimed at stimulating private sector investment provide insufficient incentives for overcoming risk (Hecht et al., 2009; Hotez et al., 2013; WHO, 2012).

A number of high-level meetings have recognised that, if there is to be an increase in global R&D investment, LMIC governments need to commit to spending a proportion of national budgets on health R&D. Over the years, various declarations have called for increasing investments in research for health by LMIC governments. Governments at the 2007 African Union Summit (Barnsley & Sherman, 2007) pledged to spend at least 1% GDP on R&D, while in the Bamako Communique (2008) and Algiers Declaration (2008), governments committed to invest at least 2% of their national health budgets on health R&D. However, recent analyses have shown that African countries still rely heavily on external donors and partnerships to fund local research (see Figure 2). The result is that health systems and health research and innovation capacities in LMICs remain under-developed and capacity to translate research results into products, services or technologies is less of a priority. With little evidence of increase in economic benefits resulting from research and innovation, even progressive countries that do invest in research and innovation will run the risk of not being able to show return on research investments, resulting in potential reversal of research and innovation funding to the detriment of health, equity and development.



As can be seen in Figure 3 below, African countries are still falling short on the pledge to adhere to international recommendations for R&D spending (Mugabe, 2013). Reasons for this include the absence of a budget line for research in the Ministry of Health budget, and the lack of specific strategy documents to mobilise resources for research (Sombie et al., 2013). In addition, policy documents have not emphasised innovation sufficiently (Mugabe, 2013). A significant opportunity is lost here. Although health R&D becomes an economic investment when products are commercialised, Africa has neither effectively invested in nor reaped the benefits of health R&D when compared with other regions (Mugabe, 2013).

FIGURE 3: PERCENTAGE GDP AND PERCENTAGE NATIONAL HEALTH BUDGETS SPENT ON R&D



However, a number of innovative developing countries (Morel et al., 2005) are emerging, specifically the BRICS countries – Brazil, Russia, India, China, and South Africa. "These countries have demonstrated a growing capacity to undertake health innovation and assume an increasing role in the development of new drugs, vaccines and diagnostic tools, as well as of new techniques and new policies in health systems and services. One characteristic of these countries is that they manage to span the spectrum from innovative research to product delivery" (Matlin, 2006). Furthermore, important new forms of financing for health R&D have begun to emerge, using a mixture of private and public funding (Hotez et al., 2013), with many of these focused on R&D for the developing world (Hecht et al., 2009).

"To help reduce the burden of disease, meet constitutional obligations and spur economic growth,

African countries need to increase their investments in health research and innovation" (Mugabe, 2013, p. 2). This means increasing their own resource base to mobilise funds towards research and innovation for health. These investments should be sustainable and should come from internal and external, public and private sources. The challenge, then, is for these countries to negotiate allocation of existing resources for their research and system needs and priorities, and to improve these financial flows for more impact. This includes creating an environment that is conducive to conducting research, promoting innovation, creating partnerships and attracting investments. Funds alone will not adequately address the inequities in research for health (Lansang & Dennis, 2004). Strengthening national research and innovation systems for health is therefore key.

2.2. Creating an enabling environment: The importance of strong research for health systems

As mentioned above, increasing funding alone is unlikely to address the challenges facing research for health in many LMICs. Unless there is a well functioning research for health system that is able to provide governance and coordination, set priorities, channel funds and regulate research, it will be difficult both to mobilise sustainable funding and to ensure that this funding is allocated efficiently. This was emphasised by the World Health Organisation (2013, p. xi) in the 2013 World Health report, which acknowledged that "to make the best use of limited resources, systems are needed to develop national research agendas, to raise funds, to strengthen research capacity, and to make appropriate and effective use of research findings." Creating an enabling environment which stimulates and supports research and innovation is critical to the success of any initiative that seeks to mobilise or channel funds towards research for health.

The objective of the Berlin meeting on sustainable investments in research for health, detailed below, was to review mechanisms for mobilising funds or allocating existing funds more effectively and to assess the relevance and feasibility of applying such mechanisms in low resource contexts. It soon became evident, however, that the priority for participants was to focus on the system within which this financing takes place. Discussions centred on bottlenecks and possibilities in the research for health system that could either hinder or promote investments in research for health. This supports the perspective that, in order mobilise funds towards research for health, systems need to be in place that can maximise those funds. In the section below, the priority issues that meeting participants raised for discussion are presented.

2.3. What do we mean by innovative financing?

Innovative financing mechanisms are novel sources or applications of funding research and development that expand on or supplement traditional funding mechanisms such as donor funding or development aid. These mechanisms have the potential to either mobilise new revenue or improve the use of existing funds. The concept of innovative financing has been defined in a number of different ways, depending on the scope of their applications (see Figure 4). Some definitions focus only on those mechanisms which tap into new revenue resources, while others expand the definition to include revenue generation as well as strategies to stimulate research and development or to use existing funds more efficiently and effectively (Michaud & Kates, 2011). Innovative financing mechanisms have also been categorised in a variety of ways, according to, for example, the extent of private and public sector involvement, or the mechanisms of action (push or pull). Appendix 5.1 provides an overview of these innovative financing mechanisms, together with a brief assessment of their viability by one or more of the groups that reviewed these mechanisms. In Appendix 5.2, these mechanisms are unpacked in more detail.

Much of the work done to develop these mechanisms has been on a global scale and is focused on research and development to produce new drugs and technologies for diseases affecting low- and middle-income countries. However, it may be possible to apply some of these mechanisms at a national level, bringing together the public and private sectors in low- and middle-income countries to invest in local research and development for health. There are also examples of innovative strategies for financing national research for health systems, including capacity development (Lansang & Dennis, 2004). Thus it is possible to leverage some of these funds to strengthen research for health systems, thereby stimulating further research and development and attracting additional investments. Importantly, innovative financing mechanisms are designed to complement existing, traditional approaches, not to displace or replace them (Michaud & Kates, 2011).

FIGURE 4: DEFINING INNOVATIVE FINANCING

"Non-traditional applications of ODA, joint public-private mechanisms, and flows that either support fundraising by tapping new resources or deliver financial solutions to development problems on the ground"

(Taskforce on Innovative International Financing for Health Systems, 2009) "Any financing approach that helps to generate additional development funds...enhance the efficiency of financial flows...[or] make financial flows more results-oriented."

(The World Bank Innovative Finance for Development Solutions) "New sources of development financing [that] are closely linked to global public goods, and complement conventional official development assistance."

(The Leading Group on Innovative Financing for Development)

3. Meeting perspectives

3.1. Meeting overview: maximising the contributions of participants

The meeting on sustainable investment in research for health was organised by COHRED's Research for Health Africa (R4HA) programme, in partnership with the West African Health Organisation (WAHO) and the New Partnership for Africa's Development (NEPAD) Agency. This one-day meeting was held in Berlin as a satellite meeting to the seventh EDCTP Forum. The meeting was attended by 35 participants from a number of different high income and low-and middle-income countries² and organisations,

including representatives from government ministries, research organisations, academic institutions, regional organisations, funding bodies and the private sector.

The meeting began with presentations by COHRED and by partners from Mozambique and Tanzania³. These presentations provided a broad overview of the global and local situation in terms of financing research and innovation for health, and set the scene for the discussion that followed. For the remainder of the day, participants identified key issues relevant to research for health funding and unpacked these issues in open space group discussions. The first open space session

^{2.} Botswana, Burkina Faso, Finland, France, Gabon, Germany, Guinea Bissau, Mozambique, Netherlands, Portugal, Senegal, South Africa, Spain, Switzerland, Tanzania, United Kingdom, United States of America

^{3.} Mozambique, Tanzania and Senegal are the countries involved in the Research for Health Africa programme (<u>http://www.cohred.org/r4ha/</u>), implemented by COHRED and the NEPAD agency.

allowed meeting delegates to participate in creative brainstorming around issues identified by the group as important. In the second session, groups sat down to explore more specific strategies for achieving greater investment in research for health.

The open space facilitation approach to the meeting allowed us to make the most creative and involved use of the knowledge and expertise of meeting participants. In open space meetings, participants determine meeting content through a relatively rigorous, creative process, and may adjust it as the meeting proceeds. The open space meeting format ensured that all issues raised could be addressed by those participants most qualified and capable of getting something done on each of them. The professional facilitation of Liesl Schoonwinkel from Facilitators without Borders, with support from COHRED's rapporteurs, Sylvia de Haan, Debbie Marais, Gabriela Montorzi and Kathelene Weiss, was key to ensuring a smooth meeting process.

At the start of the first brainstorming session, four key topics were identified by the group for further exploration. These were:

- 1. Developing an integrated system for innovation,
- 2. Shifting from the notion of "funding" to "investment",
- 3. Creating an African research space, and
- 4. Engaging in advocacy for research for health financing.

The key discussion points that emerged from each of these groups are summarised below.

3.2. Developing an integrated system for innovation

The importance of having a strong enabling environment was captured in this discussion around developing an integrated system for research and innovation. Participants recognised that bottlenecks in the system could hinder the effective use of available funds or the mobilisation of additional funds for research and innovation. Key elements that were considered essential for a well functioning system were identified as:

PRIORITY SETTING PROCESSES

Participants highlighted the importance of setting national research priorities and linking these to the grant system to ensure that priority topics are funded.

MAINSTREAMING OR DEMYSTIFYING RESEARCH THROUGH EDUCATION

Emphasis was also placed on the importance of mainstreaming research through linking to the education system to engage young people in research and, through demystifying research for the general public.

CLEAR CAREER PATHS

Research training and qualifications should be standardised and clearer career paths for researchers established.

CAPACITY BUILDING, PARTICULARLY FOR MANAGERS AND ADMINISTRATORS

This includes building capacity in the administrative and management aspects of the research system, which may assist with upgrading the status of research administrators and managers.

PHYSICAL INFRASTRUCTURE

Physical infrastructure is the basis of a strong research system. This needs to be in place to attract greater investment.

COLLABORATIVE RESEARCH

Participants felt that collaborative research should be stimulated. This includes public-private collaboration and inter-sectoral collaboration. Funds could be made contingent on showing collaborative partnerships which, in turn, could attract further funding.

EFFICIENT FINANCIAL /

GRANT MANAGEMENT SYSTEMS

An efficient financial management system is critical to ensuring that funds are well used. Investors are more likely to invest in research that has the backing of strong financial and administrative systems.

EFFICIENT FUNDING ALLOCATION RULES & PROCEDURES

Participants discussed how procedures for the allocation of funds – including what is being funded and how it is being funded – should be clarified, and competitive application processes should be put in place. This includes reviewing the corruption indices of countries and organisations before investments are made.

GOVERNMENT INVESTMENT IN RESEARCH & INNOVATION

Government investment in research and innovation was considered a crucial first step. Showing commitment from government could leverage matching funding from other sources.

EFFECTIVE REPORTING MECHANISMS

This was considered important not just to demonstrate accountability and transparency but also to ensure knowledge dissemination and translation.

FACILITATIVE REGULATORY & LEGISLATIVE MECHANISMS

Strong regulatory and legislative mechanisms could facilitate and stimulate innovation. However, participants cautioned that regulations and legislative mechanisms could also be a bottleneck to efficient research and innovation. The discussion then moved onto how research could be made more attractive to investors and how countries could become more competitive in the global research & innovation arena. Collaborative research was again emphasised here, as was the importance of being able to show return on investment in research. Building political will and interest was also considered to be a key step towards increasing the attractiveness of investing in research.

MAKING THE ECONOMIC CASE FOR RESEARCH

The economic case for investing in research could be made by linking research to cost-effectiveness and return on investment studies. Presenting a business model outlining the social and financial gains could strengthen the attractiveness of investing in research.

FOSTERING POLITICAL WILL AND INTEREST

Understanding what priorities governments have and showing how research can respond to these is one way to fostering political interest in research & innovation. Researchers could also find creative ways to generate and present data and communicate the right messages at the right time, which also requires understanding the political landscape.

SHOWING REAL INVESTMENTS MADE IN RESEARCH

By showing the actual investments that have been made in research – and specifically the research system (training, salaries, infrastructure) – is one way of showing tangible return on investment and could increase the attractiveness for others to invest in the country.

INCREASING CROSS-SECTORAL RESEARCH COLLABORATION

Developing cross-sectoral research agendas could facilitate the identification of bigger problems that can be invested in, thereby increasing the attractiveness of research. This could also mean cross-border collaboration, which might be one way of linking research to regional economic groupings. Participants also discussed how to improve collaborative research with industry while still keeping the focus on national priorities. Participants started to unpack more concrete ways of achieving strong integrated systems for innovation. Maximising the efficient use of resources could be achieved by linking research priorities to a value chain and assessing who can contribute the most at each part of the chain. Strategies for developing a research culture included showcasing role models, demonstrating the value of research as a career, establishing opportunities to follow career paths in different aspects of research, and highlighting both the positive and negative findings from research. The importance of having a champion who could promote a culture of research was emphasised, as was having a strong management culture to provide stewardship over the business of research. Using 'creative acquisition' to acquire the best minds and ideas would help to increase countries' research competitiveness. Evaluating research and measuring achievements could help countries to compare their performance with international benchmarks. Cross-sectoral collaboration could be stimulated by creating opportunities to meet (brokering) and by incentivising researchers to conduct research in their sectors through, for example, robust salary structures. Participants also suggested delinking funds for research from funds for innovation, acknowledging the role of risk in investing in innovation.

3.3. Shifting from funding to investment

Participants in this group were concerned with how to effect a paradigm shift from thinking about research funding to thinking about research investment. This was in part an attempt to move away from a certain complacency in grant funding that is predicated on the notion that countries or organisations are dependent on others (donors) to do things for them. Investment implies finding ways to be proactive and invest in research themselves. Further, thinking about investment in research means expecting a return on investment in the form of impacts, outcomes and financial or other gains. Promoting knowledge as an investment is fundamental to this, as is making the link between knowledge and innovation through translating research into products or productivity. Participants suggested that one strategy would be to provide innovation funding that matches research funding to get beyond publications as the measure of research success, and move towards product development.

In the spirit of ensuring returns on investment, one participant explored how to view the notion of funding as synonymous with research projects, and the notion of investing as synonymous with the whole research system. There was some discussion about the two types of priorities that health research seeks to address. The first is the promoting health and health systems, which implies a public health – and public funding – focus and needs the backing of Finance or Development ministries. The second is promoting innovation, which implies creating an enabling (policy & infrastructure) environment and incentives for private investment. Depending on the focus, investment will unfold quite different.

The idea that money makes money was captured in the suggestion that countries need to invest in their own research and innovation system in order to attract further investment. With the idea that investment in the whole system as opposed to just research was a critical first step, the discussion then shifted to focus on how to strengthen research and innovation systems in order to attract investors. The overlap between many of the factors explored during this discussion and the group discussion on strengthening integrated systems for innovation is striking:

STRENGTHENING INFRASTRUCTURE

Participants emphasised the importance of investing in research infrastructure as a starting point.

STRONG FINANCIAL AND ADMINISTRATIVE MANAGEMENT SYSTEMS

Strong governance systems and financial management mechanisms that allow for accountability and transparency are essential components of a well functioning research and innovation system. It was also suggested that promoting data systems could enhance transparency and hold researchers to account.

COLLABORATIVE RESEARCH

Supporting systems of innovation should be established that enable cross-pollination between different research sectors (e.g. health, environment, agriculture, ICT, business). Establishing research networks which could attract regional joint investment was also highlighted here.

BUILDING CAPACITY

Participants spoke about improving (African) research competitiveness in order to be able to compete globally in the research & innovation arena. This means building a critical mass of researchers / scientists to attract investment, and attracting the Diaspora back into the country.

FOCUSING ON THE EDUCATION SYSTEM TO PROMOTE A CULTURE OF RESEARCH

Education around research should include the notion of health and / or research as a business, and equip researchers with skills in how to mobilise resources, develop business plans and write project proposals for investors. South-tosouth cooperation in terms of training could be strengthened. In addition to formal training and education, participants felt that more could be done in raising awareness among the general public about the value of research.

MAXIMISING PUBLIC AND PRIVATE INVESTMENTS

One idea here was that governments could put up funds for operational (system) costs and any other research financing could be channelled to research projects. Participants cautioned that this approach would work only if the research projects are aligned with national priorities. There was agreement that ensuring the long –term sustainability of investment is critical, with some discussion about endowment funds and issuing bonds for research. These funds could then be used to leverage further investment. It was also suggested that there should be incentives for innovation in the private sector.

MAKING THE CASE FOR RESEARCH INVESTMENT

There was considerable discussion regarding how to make investment in research an attractive endeavour and who should take on the responsibility of making this case. Some suggested that it was critical to present key issues like those raised during this workshop at Ministerial meetings and conferences. The theme of advocating for research was taken up and explored in more detail in another group (see section below).

In the afternoon session, participants identified which of the discussion points raised in the morning brainstorming session should be explored in further detail, with a view to unpacking the 'how' of shifting from funding to investment.

TRACKING RESEARCH THROUGH OPEN DATA SYSTEMS

It was felt that establishing systems for tracking all the research being conducted in a country would allow countries to begin to show return on investment. There was some discussion around incentivising researchers to make their data available, perhaps by ensuring further investment in return for open data.

SHOWING THE IMPACT OF RESEARCH ON GDP

Some participants spoke about the success in their countries of showing that research has contributed positively to GDP, thereby demonstrating return on investment. Using models to show the impact of research on GDP, as well as best practices drawn from where this is being done, could assist other countries to show how research is an end in its own right.

FOSTERING A BUSINESS MINDSET IN RESEARCHERS

Exposing researchers to business thinking could help them to see their task as investing themselves in a research enterprise. This could also help them to demonstrate the value of investing in research to relevant ministries. Extending on this, participants spoke about creating platforms to bring researchers and ministers from all relevant ministries – not just Health, but also Finance, Treasury, Planning – together.

CREATING INTEGRATED RESEARCH AND INNOVATION PLATFORMS

Making efficient use of existing resources – like creating integrated S&T platforms where facilities and administrative systems are shared – could strengthen the system and attract serious investment in that system. Participants emphasised that no part of the system should be neglected when making investments.

UNDERSTANDING THE POLITICAL LANDSCAPE AND THE PRIORITIES OF A SOCIETY

Some participants felt that the notion of collaborative research was somewhat idealistic and highlighted how competing interests and competition for scarce resources could thwart this goal. Some suggested that an equally important skill is to understand how a society or system operates, since one cannot assume this is always rational. This requires an ability to be flexible and responsive to situational realities.

STRENGTHENING ACCOUNTABILITY AND TRANSPARENCY

There was some discussion about enhancing accountability by streamlining or standardising financial management systems using a government-endorsed manual of procedures. This could work well for the use of public funds but becomes more complicated when the funds are from external or private investors. It is also important to balance transparency and efficiency, as too many checks and balances can limit the efficiency of research process. Another way of strengthening accountability could be to open audited bank accounts for researchers to circumvent the long process of establishing accountability before they get funding. A credible auditing firm could be the auditing body of these bank accounts, or an accredited NGO could do the upfront management of the money, which allows for efficiency and transparency.

As is evident from the discussion above, a strong focus of the two groups described thus far was on creating strong research systems to attract investment. Both groups highlighted the importance of promoting collaborative research as one way of achieving this. The third group took this concept further by exploring the possibility of creating an African research space.

3.4. Creating an African research space

Recognising the fragmentation of research in Africa, and expanding on the potential of collaborative research to attract investment, this group focused on how this could be maximised through establishing an African research space. Exactly what form this space would take - as a network, an organisation, or a virtual space – was left open for discussion as participants felt that the definition of the space should be the result of consultation with all stakeholders. There was also no final agreement on whether the first step would be to work towards harmonisation regionally, or start immediately at the continental level. The rationale for creating this space was based on the idea of Africa as 54 unified countries in 5 unified regions, housing 1 billion inhabitants, brimming with untapped potential. Unification would be based on common regulatory and policy frameworks for research and harmonised approaches, such as COHRED's framework for research for health system strengthening. Moving towards a shared research space would have the benefit of optimising African research development and maximising local and global investments. A number of steps were identified as critical in the creation of this African research space.

UNDERSTANDING THE LANDSCAPE

There was agreement that it is important to first understand the landscape in terms of what is already in place and how it can be utilised or improved. Thus it was suggested that a mapping exercise be undertaken, to map all existing research frameworks and networks, as well as regional or continental groups that already exist (for example, ANDI, NEPAD, WAHO, AU, SARIMA). This mapping exercise could also highlight different regional characteristics that need to be taken into account when establishing this research space.

HARMONISING STEWARDSHIP

Discussion moved to how to get the ball rolling and how this effort could be lead by regional organisations, while still ensuring that it captures the national identity of each country. Once the different components of the research space have been defined, the regional or continental organisation would integrate this into their action plan and budget and be responsible for delegating responsibilities to different regions and countries. The idea would be to establish common regulation processes that could be applied across countries. A first step would be to assess the extent to which research agendas can be harmonised, which is contingent on encouraging all countries to have their own research agendas. There is also a need for an independent advisory board or committee that could mediate between competing interests of different countries and regions.

ENGAGING ALL STAKEHOLDERS

Promoting open dialogue between all stakeholders, both during and following the creation of the research space was considered essential. Participants suggested following a twoway, bottom-up and top-down approach to ensure a continuous feedback loop so that all interests were fairly considered. This may entail setting up feedback mechanisms at country, regional and continental levels, utilising available tools that could facilitate this feedback, such as COHRED's Health Research Web. Working through research networks could provide the unifying structure needed to bring interest to the highest levels. Principles for engaging stakeholders included consensus building, inclusivity, team building and equity in terms of considering all contributions meaningful, regardless of the socioeconomic level of each contributor.

SECURING CONSISTENT FUNDING

The importance of securing consistent funding was recognised by participants in this group, through identifying a range of funding mechanisms. This could be directly from countries or from regions through regional organisations. At continental level, countries could pool resources to generate or respond to calls for proposals. International organisations could contribute by creating a window of sustainable funding for promoting regional cohesion.

ADDRESSING BOTTLENECKS

A unified African research space has the potential to address a number of the bottlenecks identified in other group discussions. The advantages of this space include improved organisation, less fragmentation, academic harmonisation, strengthened skills, stronger mechanisms through which to channel research funding, and providing a platform for Africa to become a strong negotiator in the research funding world.

LEVERAGING AFRICA'S POTENTIAL

This space was seen to have the potential to leverage Africa's potential and give it an equal place at the global table, both in terms of being a beneficiary of funds and bearing the responsibilities that come along with that. Each country's unique contribution was seen to culminate in a strong cohesive whole, which in turn would stimulate creativity and innovation. However, participants also recognised the difficulties inherent in trying to harmonise between 54 different countries and were sensitive to the fact that there may be competition for scarce resources.

3.5. Engaging in advocacy

Advocating for sustainable investments in research for health was considered critical to move from declarations about the importance of such investments, to action. Investors – from governments to private sectors – could be convinced of the case for research for health financing through a number of advocacy efforts, discussed below.

MOVE FROM DECLARATION TO ACTION

There have been many declarations about the importance of investing in research for health. Participants felt that these have not been disseminated widely enough to get into public awareness and into government decision making. Better advocacy tools or strategies are needed to move from the document to putting the principles into practice.

INCENTIVES FOR PUTTING PRINCIPLES INTO PRACTICE

Linked to the above, there were suggestions about how to incentivise governments, organisations and individuals to put the calls for action into practice. One idea was to use regional organisations that could add credible weight to the argument or increase pressure to invest in research for health. Another suggestion was to establish inter-country peer review mechanisms to follow up on declarations.

USE MULTIPLE METHODS TO ADVOCATE

Recognising that there are many different ways of communicating a message, participants discussed a number of ways in which to advocate for research for health investment. These included: adding research to the agenda of political meetings; maximising opportunities to communicate with politicians; more effective engagement of the media as an advocate; utilising influential people or role models to champion the cause; highlighting success stories at national and international level; communicating messages in many languages; and establishing advocacy teams comprising experts, researchers and communicators or knowledge brokers. That said, participants highlighted that advocacy is something that should be done by all.

WIDEN THE SCOPE OF YOUR AUDIENCE

In terms of research for health, the Ministry of Health is typically the government department that is targeted. But participants stressed that researchers need to broaden their scope to include other government departments – particularly the Ministry of Finance, Ministry of Planning or Ministry of Industry. Importantly, researchers need to customise their message depending on the audience they are wanting to reach and the results they are hoping to achieve. When advocating, it is important to be clear about who for, what, where, why, when, and how.

CREATE A SCIENTIFIC CULTURE THROUGH EARLY EDUCATION

The idea that the role of science in society is not well understood came up again in this group, with the participants arguing for the importance of promoting a culture of research. This could be done, in part, by including research in early education – such as building in mechanisms to curricula to foster interest in science and research or encouraging on the job training for high school students – so that research comes to be seen as a viable career from early on.

CHANGE THE PERCEPTION OF HEALTH RESEARCH

Participants felt that changing the perception of research as simply about improving health to an important job or set of skills that can drive the economy would be an effective means of showing governments and the public that research for health can have a 'triple bottom line.'

MOBILISE CIVIL SOCIETY / PUBLIC DEMAND

By raising awareness about the value of research among the general public, participants felt that this would increase the demand for research in civil society, as well as greater demand for using evidence in making public health decisions.

OPEN DAYS

Another way of making research more approachable to the general public is to hold open days at research institutions and scientific laboratories, showing the importance of research and building an appetite for an interest in research as a key discipline. The public was seen as a powerful mechanism through which to influence governments.

BUILDING RELATIONSHIPS

Relationships built on trust were seen as fundamental to effective advocacy. Participants stressed the need to build long term relationships with government departments and advocating in a friendly, transparent, one-on-one basis. However, there was acknowledgement that there is often high turnover in government departments and important groundwork can be lost in terms of building relationships. Participants recognised that this is an important factor to focus on improving if advocacy is to be successful in this arena.

MAKE THE IMPACT OF RESEARCH KNOWN

When research results in successful outcomes and interventions are implemented, it is critical to communicate this impact back to the communities that are served by these outcomes. This goes back to the idea that communities can influence governments. Further, the impact of research on GDP and on other fields (in terms of generating solutions to problems) should be widely publicised. There was also the suggestion that governments and communities may not realise just what an impact research is having on their lives until that research stops happening (e.g. clinical trials). Participants felt that this would be a powerful message to get out there.

EFFECTIVE COMMUNICATION OF HARD DATA

Participants felt that statistical findings can be robust and convincing arguments conveying the impact of research. The durability of such data was considered an advantage in using them in advocacy arguments in a number of different ways. Over and above this, researchers or advocates should take care to ensure that the 'consumer' of research knows how to use and interpret research data.



In the second session, participants prioritised which of the ideas generated in the morning session should be explored in more depth to build a multi-pronged advocacy strategy. Four key points were identified:

1. Establish an inter-country or regional peer review mechanism for follow up of key declarations

To ensure that the principles in many of the declarations calling for greater research investment are implemented, participants discussed how peer pressure could be an effective tool to track, through continental (e.g. the African Union) and / or regional organisations (e.g. WAHO), how well a country is doing in terms of investing in research and in terms of research production, using a set of defined indicators or metrics (e.g. % budget to health, % budget to research, number of publications or products). By comparing their rankings with other countries, governments could be encouraged to do better, possibly learning from the best practices of their neighbours. Underperforming countries should receive some support to do better. Participants took this one step further by emphasising that these metrics should feed back into further research or policy. Further, these metrics should apply not just to government performance but also to industry and other stakeholders, and they should be updated every 2 to 5 years.

2. Engage the media as an advocate

One way of making more effective use of the media would be to have high impact events to communicate the results of research to the public. Participants recognised the importance of having capable journalists who understand research as well as mediasavvy researchers. Some suggested having prizes for journalists or researchers who proved to be effective communicators of research. There was also discussion about the research community developing its own media forums and not only relying on traditional media outlets or mechanisms. A further possibility would be to create an association specifically for media engaged in research and scientific communication, and to build this network as an advocacy tool. Ensuring that positive news comes out of Africa was also emphasised.

3. Create a scientific culture through early education

Fostering a scientific culture to government departments and to the general public was considered essential for increasing buy in to the value of research in the community. This could be done through roadshows, where researchers could be encouraged to speak about their work in ways that make it accessible to the public. Addressing the decrease in scientific education and encouraging research or scientific activities and education from an early age were other strategies that were proposed.

4. Widen the scope of the audience to include other ministries

Recognising that research for health requires the involvement of many sectors, participants stressed making research attractive to all stakeholders and sectors, such as finance, business, information technology and so on. Being able to show return on investment would help to demonstrate the value of research.

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5. Appendices

5.1. Overview of financing mechanisms

Some innovative financing mechanisms for health R&D are currently operational, others are still in the proposal stage. A number of groups have been instrumental in reviewing the operational and proposed mechanisms. The information provided in this section is drawn from the work of three of these groups⁴: WHO CEWG (2012); Michaud and Kates (2011); and the Milken Institute (MacLean 2012).

In 2010, the World Health Assembly established the Consultative Expert Working Group on Research and Development: Financing and Coordination (CEWG) to take forward the work done by the previous Expert Working Group on Research and Development: Coordination and Financing (EWG) (WHO, 2012). As part of the CEWG report published in 2012, the group provides a review of innovative financing proposals, assessing these based on a number of pre-defined criteria.

In 2011, the Henry J Kaiser Family Foundation commissioned a report on innovative financing mechanisms for global health to identify whether and how the United States government could – or should – participate in such mechanisms. In this report, Michaud and Kates (2011) outline a classification system of the different types of innovative financing mechanisms and provide an inventory of financing mechanisms that are either proposed or currently in use.

In 2012, the Milken Institute, with support from the Bill & Melinda Gates Foundation, convened a Financial Innovations Lab to map current and potential innovative financing models with the goal of leveraging traditional sources of aid to attract private-sector investment and increase sustainable funding for R&D (MacLean, 2012).

As can be seen in Table 1 below, financing mechanisms can be classified into two main categories: those which are aimed at raising new revenue by tapping into novel funding sources, and those which aim to stimulate research and development by establishing more effective channels for fund allocation. Mechanisms in the latter category are "intended to go beyond what traditional grant or market incentive mechanisms can do, for example, by serving to alter standard market incentives (e.g., through increasing the incentives to invest in R&D) or providing public research funding in non-traditional ways (e.g., through tax credits, prizes, or based on the health impact of innovations)" (Michaud & Kates, 2011, p. 6).

Table 1 provides an overview of these innovative financing mechanisms, together with a brief assessment of their viability by one or more of the groups that reviewed these mechanisms.

^{4.} This was supplemented with other reviews and assessments, including Atun, Knaul, Akachi & Frenk, 2012; Grace, Pearson & Lazdins, 2011; Hecht et al., 2009.

TABLE 1: OVERVIEW OF INNOVATIVE FINANCING MECHANISMS

TYPE OF MECHANISM	EXAMPLES	VIABILITY
1. Mechanisms to mo	bilise funds	
1.1. Taxes New revenue is raised by taxing products or transac- tions	 Airline ticket tax Tobacco solidarity tax Financial transactions tax Taxation of pharmaceu- tical industry profits Other new indirect taxes 	"It is our view that some form of taxation is the most fruitful avenue to explore in the search for new and sustainable sources of funding. However, it would be unrealistic, given the multifacet- ed nature of development needs, to think that one specific new source that would generate very significant amounts of money on a global scale would or should be devoted to the particular field of health R&D of relevance to developing countries. Rather we would argue that, from any new source of funding that might emerge, a portion should be related to the improvement of health as an acknowledged development priority and that anoth- er portion also should be devoted to currently underfunded R&D areas" (WHO, 2012).

1.2. Raising or directing private investments

Tapping into or mobilising new investments to R&D from the private sector

Impact investing	•	Equity models Debt models	"Impact investments have shown success in generating new financial support for global health but not yet in increasing fund- ing for research and development (R&D) addressing the health needs of low- and middle-income countries (LMICs)" (Wingfield et al., 2013).
Risk pooling or credit guarantees	•	Overseas Private In- vestment Corporation (OPIC)	"OPIC financial products are successful in catalyzing additional investment in developing countries, which makes them interest- ing in terms of replication by other development finance institu- tions to support global health-related activities. The OPIC model is simple but impressive in its leverage capabilities. Because of its strong investment criteria and extensive due diligence, it has a track record of success that perpetuates the strength of its products. Lab participants discussed how these models could be replicated to provide direct support to segments of the market and serve as potential revenue offshoots for the PDPs" (MacLean, 2012).
New private sector models: catalysing private sector investments	•	Exchange-traded funds (ETFs) Fund-of-fund fee models GDP-linked securities Impact-focused com- pensation incentives	"Participants agreed that much more work was needed in this area to complement current models. UNITAID, an international drug purchaser facility, has successfully rechanneled funds with a small airline surcharge, and if this model can be successful for asset management models as well, there could be opportunities to engage new investors without having to compromise return on investment and without the "middleman" of a financial inter- mediary, as there is in some impact investing products" (MacLean, 2012).
 1.3. Voluntary consumer-based funding Adding additional, voluntary contri- butions to selected consumer products 	•	Consumer prod- uct-based donations Airline ticket voluntary solidarity contribution Mobile phone solidarity contribution Lotteries	"We do not believe that it is realistic to expect voluntary contribu- tion schemes to raise very large sums of money on a sustainable basis for health R&D relevant to developing countries. The expe- rience of the Millennium Foundation suggests that "innovative" voluntary contribution schemes are quite difficult to develop into significant and sustainable flows of funds. Moreover the willing- ness of the public to contribute will be determined by the priority they assign to this particular use of funds as compared to the variety of other possible uses in the field of health or of devel- opment more generally. Our view is that "traditional" financing mechanisms based on direct or indirect taxation are more likely to succeed than a complex landscape of uncoordinated voluntary so-called "innovative funding mechanisms" of uncertain funding capacity and stability" (WHO, 2012).

TYPE OF MECHANISM	EXAMPLES	VIABILITY
1.4. Front loading funds	International Finance Facility (IFF)	"A new version of IFFIm (GAVI) could be useful to complement other funding sources. But given the current economic climate, large upfront pledges by governments seem unlikely at this time.
Long-term donor pledges to leverage short-term funding		Participants agreed that the idea could be developed now and implemented when government budgets return to pre-crisis levels" (MacLean, 2012).
1.5. Redirecting credits or debts	Debt buy-downsDebt forgiveness for health	"Involve transferring capital from traditional financial market transactions into funds to support global health. Much more work is needed in this areas to complement current models. Presents
Leveraging credits and debts for R&D financing	De-taxIMF Assets	opportunity to engage new investors without having to com- promise on return on investment and without middleman of a financial intermediary" (MacLean, 2012).

2. Mechanisms to more effectively allocate or channel funds and stimulate R&D

2.1. Push mechanisms Provide up-front funding to drive research and devel- opment through the product pipeline	• • • •	Grants National funds PDPs Tax credits for R&D organisations Patent fee / Green IP Patent pools Pooled funding (e.g.	"A drawback of push financing is that funders (governments, foundations) pay for inputs (research projects, clinical trials), not outputs (new drugs and vaccines), so they may ultimately spend on R&D activities that lead nowhere. Faced with the challenge of picking "winners," donors rely on expert peer review panels (which have been criticized for review bias) and specialized intermediaries such as PDPs to guide their investment decisions" (Hecht et al., 2009).
		PDP-FFF, IKFF, FRIND)	"Based on an analysis of the three pooled funding ideas—PDP-FF, IRFF, and FRIND—and assessment of the current environment and the mood of the donors, we are fairly pessimistic about the prospects of seeing one or several of these ideas launched in the next few years. The case for investing time and resources in establishing any of the three funds, in their current form, is weak at presentThere is a limit to what funders can absorb (and) you will soon face donor fatigue" (Grace et al., 2011).
			"Unlike the AMC and IFFIm, a pooling mechanism, such as the PDP Financing Facility, has yet to be implemented. During the Lab, it was suggested that greater study of feasibility should be undertaken" (MacLean, 2012).
2.2. Pull mechanisms Provide financial or other incentives for completed prod- ucts at end of R&D pipeline	• • •	Advanced market commitments (AMC) Medicines subsidy Prizes Patent review voucher Priority review voucher Health impact-based funding Milestones R&D incentives	"Since pull mechanisms pay for outputs rather than inputs, they avoid the difficulty of picking winners, but they introduce another problem: how to set the financial reward at the right level. If the reward is too small, product developers will not be motivated to invest in the R&D if it is too large, funders will have "overpaid," losing taxpayer or foundation money that could have been used for other purposes. Another problem with pull mechanisms is specifying the characteristics of the end product—a major chal- lenge for products in the early stages of R&D. If a funder specifies a target product profile too narrowly, innovation may be limited and potentially valuable options may be overlooked. A target product profile that is too general can lead to a product that does not serve the intended purpose" (Hecht et al., 2009)

5.2. Detailed Matrix of Innovative Financing Mechanisms

The innovative financing mechanisms identified above are unpacked in more detail in Table 2 below, outlining how money is raised and channelled through each mechanism. Examples of where or how the mechanism has been implemented (or is intended to be implemented) are provided where such examples exist. Finally, readers are referred to the primary sources for a more detailed review of each mechanism, where applicable. The information in this table has been compiled from reports by Michaud and Kates (2011), MacLean (2012), and WHO (2012).

TABLE 2: DETAILED MATRIX OF INNOVATIVE FINANCING MECHANISMS

MECHANISM	PRIVATE / PUBLIC / MIXED	HOW MONEY IS RAISED	FINANCING MODALITY	EXAMPLES / IMPLEMENTERS	FURTHER INFORMATION
	MECHAN	IISMS TO MOBILISE F	UNDS / RAISE REVENU	JE / GENERATE RESOURCES	
1. Taxes: r than po	new funds ger or) vs. regress	nerated by applying ta ive (public health ben	axes to selected transac efits)	tions. Can be progressive (bears	more on rich
Airline ticket tax	Public	Small obligatory tax on international passenger airline tickets in different countries	Raised revenue is hypothecated to an international body which channels it to research organisations	UNITAID is primary beneficiary of this mechanism, supported by multiple countries: Cameroon, Chile, Congo, France, Madagascar, Mauritius, Niger and Republic of Korea	Michaud & Kates (2011) WHO (2012)
Tobacco solidarity tax	Public	Micro tax on tobacco sales	Raised revenue contributes to research organisations	Proposed by the World Health Organization Thailand applies 2% surcharge on alcohol & tobacco, which is used to fund health promotion Philippines applies 2.5% tax on alcohol & tobacco	Michaud & Kates (2011) WHO (2012)
Financial transactions tax	Public	Small obligatory tax on financial transactions (e.g. currency, derivatives, equities)	Raised revenue is channelled through an international mechanism to supplement national resources	In proposal phase for application at global level, with France the primary proponent. Instituted domestically by at least 40 countries	Michaud & Kates (2011) WHO (2012)
Taxation of pharma industry profits	Public	Tax the profits of non-domestic pharmaceutical companies	Proceeds recycled by a directing council to eligible bodies	Italian Medicines Agency set up an ad hoc fund requiring pharma companies to contribute 5% of annual expenditure to health R&D	WHO (2012)
Other new indirect national taxes	Public	Raising revenue through taxes on, for example, the arms trade, internet traffic, bank account transactions or other sin taxes	Revenue directed towards a pooled fund or organisation that then allocates funds to eligible bodies	Ghana applies 2.5% share of VAT to national health insurance scheme. Chile applies 1% of its VAT to fund health. Gabon applies a 1.5% levy on post-tax profits of companies & 10% tax on mobile phone operators	WHO (2012)

MECHANISM	PRIVATE / PUBLIC / MIXED	HOW MONEY IS RAISED	FINANCING MODALITY	EXAMPLES / IMPLEMENTERS	FURTHER INFORMATION
2. Raising	/ directing p	rivate investments /	capital market-based	models	
2.1. Impact develop	investing: inv bing countries	vestment assets poolin , with an explicit goal	ng and directing private of generating social be	e financing to support products nefits along with financial returr	or industries in Is
Equity models	Private	A public or private sector organisation makes initial investment to secure additional funds		Global Health Investment Fund (GHIF) established in 2011 by JP Morgan Chase & the Bill & Melinda Gates Foundation	MacLean (2012)
Debt models	Mixed	Uses assets – such as a portfolio of technologies – to attract public, philanthropic and private investment. The portfolio of products is used to secure debt financing (a research-backed debt obligation)	The revenue from any successful products coming out of a portfolio would be used to repay the debt		MacLean (2012)
2.2. Risk Po partially	oling / Credi guarantee lo	t Guarantees: uses pu ans (credit guarantees	ublic financing to share s)	investment risks (risk pooling) o	r to fully or
Risk Pooling / Credit Guarantees	Mixed	OPIC, a US development finance institution, offers long term debt financing through direct loans and guarantees and by supporting the creation of externally managed private equity funds to make direct investments	Public funds used to share investment risks or to guarantee loans in order to attract further private investments	The United States Overseas Private Investment Cooperation (OPIC) The UN Foundation's Pledge Guarantee for Health (PGH) World Bank's Multilateral Investment Guarantee Agency (MIGA)	MacLean (2012) Michaud & Kates (2011)
2.3. New pr tradition	ivate sector r nal financial m	nodels: catalysing pr narkets	ivate investments in res	earch for health by transferring	capital from
Exchange- traded funds (ETFs)	Private	Private investment instruments are traded on market exchanges	Part of collected fees are transferred to fund global health programmes	The Global Fund, in coordination with the Deutsche Bank, created an ETF that tracks an index created in partnership with Dow Jones, which lists companies that support global health and then makes investments with this index as the benchmark	MacLean (2012) Michaud & Kates (2011)
Fund-of-fund fee models	Private	Small portion of transaction fees from hedge funds or a fund of funds	This portion is transferred to a pool to finance the drug pipeline in PDPs		MacLean (2012)

MECHANISM	PRIVATE / PUBLIC / MIXED	HOW MONEY IS RAISED	FINANCING MODALITY	EXAMPLES / IMPLEMENTERS	FURTHER INFORMATION
GDP-linked securities	Private	Multilateral banks issue bonds with the coupon linked to the increases in GDP that result from improvements in human capital and labour productivity because of new drugs & vaccines			MacLean (2012)
Impact- focused compensation incentives	Private	Private equity funds link general partner compensation bonuses and carries the additional financial incentives linked to fund performance benchmarks, to the social and environmental impact of the fund		Aureos Capital's Africa Health Fund	MacLean (2012)
3. Volunta	ary consumer	-based funding: tap	ping into voluntary co	ntributions from consumers	
Consumer product-based donations	Private	Proceeds from branded products	Proceeds directed towards research organisations	Product Red, supported by The Gap, Starbucks, Apple, which contributes to Global Fund	Atun et al. (2012) Michaud & Kates (2011) WHO (2012)
Airline ticket voluntary solidarity contribution	Private	Voluntary additional charge added to ticket price	Additional revenue donated to support health projects	UNITAID contributed \$22 million to create the brand MASSIVEGood, supported by ticket buyers in multiple countries.	Atun et al. (2012) Michaud & Kates (2011)
Mobile phone solidarity contribution	Private	One-time or recurring donations made by private individuals or mobile phone companies	Donations are allocated to NGOs or other organisations	Red Cross raised funds in this way after 2010 earthquake in Haiti	Michaud & Kates (2011)
Lotteries	Public	Revenue raised through national lotteries	Revenue channelled to health R&D	Belgium & UK lotteries transferred \$6 million to countries in 2007. UK lottery 2011-2012 provides \$38 million to international communities	WHO (2012)

MECHANISM	PRIVATE / PUBLIC / MIXED	HOW MONEY IS RAISED	FINANCING MODALITY	EXAMPLES / IMPLEMENTERS	FURTHER INFORMATION
4. Front lo	ading funds:	leveraging long-term	pledges of assistance t	o generate funding in the short	-term
International Finance Facility (IFF)	Mixed	Investment bonds backed by long-term donor pledges ("an innovative way to use ODA")	Proceeds from bonds are used to make grants or loans	Supported by multiple countries, including Brazil, France, Italy, Spain, Netherlands, UK, Norway, South Africa, Sweden. GAVI has been beneficiary of some of these funds through IFFIm (IFF-Immunization)	Atun et al. (2012) Hecht et al. (2009) MacLean (2012) Michaud & Kates (2011)
5. Re-dire	cting credits	or debts: leveraging of	credits and debts for fin	ancing	
Debt buy- downs	Mixed	Third party donors 'buy down' interest on a loan, reducing borrowing costs	Freed up funds are directed to health projects	Coordinated by World Bank. Buy down funds facilitated health programmes in Pakistan & Nigeria; HIV/AIDS programmes in Botswana	Michaud & Kates (2011)
Debt forgiveness for health	Public	No direct financing: Lenders forgive country debt	Forgiven debt is to be directed to health projects	Debts of 50m Euros, 40m pounds, 19m dollars and 75m AUS\$ has been forgiven in past years	Michaud & Kates (2011)
De-tax	Public	A percentage of VAT is waived	% waived VAT redirected to health projects	Proposal made by Italy but not yet implemented. Only applicable in countries with VAT system	Michaud & Kates (2011)
IMF Assets: gold sales / special drawing rights (SDRs)	Public	IMF sales of gold reserves or distribution of Special Drawing Rights (SDRs) credits to developing countries	SDRs are financial assets that can be converted to cash or used to leverage credit terms	Following the financial crisis, International Monetary Fund allocated about \$250billion in SDRs. Not yet applied to health	Michaud & Kates (2011)
	ME	CHANISMS TO ALLO	CATE / CHANNEL FUN	DS / STIMULATE R&D	
1. Push m	echanisms: fi	nancing or other ince	ntives provided to inno	vators upfront, which reduce ris	ks or costs of R&D
1.1. Grants (traditional)	Mixed	Largely funded by grants from public sector and philanthropic sources		Possibly look at non- traditional donors like China, India & Venezuela	WHO (2012)
1.2. National funds	Public	Variable. Could be a percentage of national budget (e.g. line items in Ministry of Health or Science & Technology budgets)	A mechanism for dispersing national contributions to R&D	Applied in various countries: South Africa, Indonesia, Rwanda, Zimbabwe, Chile, Nigeria Burkina Faso, Ghana (proposed) Namibia (proposed), Tanzania (proposed)	
1.3. PDPS	Mixed	Public/private/ academic partnerships	Facilitate cooperative R&D on products for global health	Medicines for Malaria Venture, IAVI, PATH, Aeras Global TB Foundation. Donors include Gates Foundations, USAID and NIH	Hecht et al. (2009) Michaud & Kates (2011) WHO (2012)
1.4. Tax credits for R&D orgs	Public	Companies get tax credits for investments made in R&D	Tax credits are intended to incentivise R&D	The UK provides tax credits through R&D and Vaccine Research Relief programmes	Michaud & Kates (2011) WHO (2012)

MECHANISM	PRIVATE / PUBLIC / MIXED	HOW MONEY IS RAISED	FINANCING MODALITY	EXAMPLES / IMPLEMENTERS	FURTHER INFORMATION
1.5. Patent fee / Green IP	Public	New obligatory fees for patent applicants & patent holders. In return for fees, patentees get insurance to compensate them for losses from IP encroachment	Resources raised go towards neglected disease research	Proposal for a Green Intellectual Property Project	Michaud & Kates (2011) WHO (2012)
1.6. Patent pools	Mixed	Unclear. Patient- holders share proprietary molecules, drugs, manufacturing processes etc, to stimulate collaborative R&D	Patent holders can either share patent royalty-free or receive payments from use of their patents	UNITAID's Medicine's Patent Poll for HIV – Roche & Gilead agreed to participate, NIH provided royalty-free licences	Michaud & Kates (2011) WHO (2012)
1.7. Pooled fund upon R&D project	ling: private a t portfolio	nd public donors colle	ectively fund an investr	nent pool, which is directed to a	jointly agreed-
Social impact bonds (SIB)	Mixed	Government sells bond-like instruments to investors	Capital from sales is used to provide funds to research orgs	Success in UK. Beginning to see implementation in United States	MacLean (2012)
PDP-Financing Facility	Mixed	Draw on contributions from multiple public & private funders to establish an R&D fund. Donors issue bond guarantees, bonds are sold on capital markets. Bondholders are repaid through revenues from product sales	Grants are issued to PDPs through pooled fund, distributed across range of R&D development continuum. PDPs receive a predetermined share of the pool, which can be drawn down over a number of years	Proposed by IAVI	Grace et al. (2011) MacLean (2012) Michaud & Kates (2011)
Industry R&D Facilitation Fund (IRFF)	Mixed	Draw on contributions from multiple public & private funders to contribute grants to a common pool	Pooled fund distributed across range of R&D projects at different stages of product development continuum. PDPs reimburses for a fixed percentage of their expenditure	Proposed by the George Institute	Grace et al. (2011) Michaud & Kates (2011)
Fund for Research in Neglected Diseases (FRIND)	Mixed	Draw on contributions from multiple public & private funders to contribute grants to a common pool	Pooled fund distributed on a competitive basis across range of R&D projects at different stages of product development continuum	Proposed by Novartis	Grace et al. (2011) Michaud & Kates (2011) WHO (2012)

MECHANISM	PRIVATE / PUBLIC / MIXED	HOW MONEY IS RAISED	FINANCING MODALITY	EXAMPLES / IMPLEMENTERS	FURTHER INFORMATION		
2. Pull me which e	2. Pull mechanisms: financial rewards or other incentives provided to innovators for progress or completion of R&D, which enhance market opportunities						
2.1. Advanced market commitments (AMC)	Mixed	Guaranteed advance purchase contract / commitment to subsidise purchase price	Incentivises R&D through guaranteeing market for end- product	GAVI Alliance funds the purchase of pneumococcal vaccine, supported by UK, Italy, Canada, Netherlands, Sweden & Gates Foundation	Hecht et al. (2009) MacLean (2012) Michaud & Kates (2011) WHO (2012)		
2.2. Medicines subsidy	Public	Unclear	Subsidises first-line purchase of drugs from manufacturers to reducer consumer price of medicines	Affordable Medicines Facility for Malaria (AMFm), supported by the Global Fund, UNITAID & the UK	Michaud & Kates (2011)		
2.3. Prizes	Mixed	Unclear: One-time cash awards	First innovator to develop a product that meets specified guidelines receives a prize	Gates Grand Challenges in Global Health	Hecht et al. (2009) MacLean (2012) Michaud & Kates (2011)		
2.4. Patent review voucher	Public	Non-financial	Provides a voucher for 'fast track' patent examination	In proposal phase	Michaud & Kates (2011)		
2.5. Priority review voucher (PRV)	Public	Non-financial	None (expedited regulatory review of another product)	FDA priority review vouchers	Hecht et al. (2009) Michaud & Kates (2011) WHO (2012)		
2.6. Health impact-based funding	Public	Unclear	Pool of public donor funds distributed to innovators of new medicines & vaccines based on their assessed health impact	In proposal phase: Incentives for Global Health	Michaud & Kates (2011) WHO (2012)		
2.7. Milestones R&D incentives	Mixed	Unclear	Product developers receive monetary rewards set up in advance as they complete milestones in the R&D / clinical trial process for target products	In proposal phase, with support from BIO Ventures for Global Health	Michaud & Kates (2011) WHO (2012)		

Sourced from: Michaud & Kates (2011), MacLean (2012), WHO (2012)

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COHRED Council on Health Research for Development

Supporting research and innovation systems for health, equity and development

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