

Research Synthesis: Advanced Market Commitments

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Introduction

The literature around advanced market commitments is considerable*, with most of the discussion focusing on the design and implementation of the pilot Advance Market Commitment (AMC) for pneumococcal vaccines implemented by the GAVI Alliance (GAVI). Most of the literature seems to have been produced from 2005 to 2011.

Search terms

Advance Market/Purchase Commitment; Guaranteed Purchase

Synthesis of the literature

Proposed Design Features

In 2005, the Report of the Center for Global Development's (CGD) AMC Working Group recommended the creation of an AMC, which attempted to replicate the pharmaceutical market conditions and incentives existing in developed countries, in order to incentivize commercial research, development and production of vaccines targeting developing country diseases (Barder, Levine, and Kremer 2005).

The AMC proposal had the following key elements: creating an approximately USD 3 billion-worth market for suppliers, providing a guaranteed floor price for a fixed quantity as well as co-payments from sponsors topping-up the amounts purchased by developing countries, defining the specifications for the expected vaccine, committing the suppliers to a specified long-term selling price for the vaccines, making vaccine purchase dependent on actual demand from developing countries, and having an "independent adjudication committee" to resolve potential disputes.

The AMC was intended to address both the lack of R&D for vaccines targeting developing country health needs and the problem of low manufacturing volumes and high prices of vaccines, both linked to the limited expected market size in developing countries (Barder, Levine, and Kremer 2005).

Berndt et al. (2007) calculated that, for an AMC to offer comparable revenues as generated by commercial pharmaceutical products, it should offer an estimated net present value of USD

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3.1 billion in revenues (Berndt et al. 2007). Barder, Kremer, and Williams (2006) argued that the AMC was a cost-effective means of addressing the lack of R&D on vaccines for neglected diseases (Barder, Kremer, and Williams 2006).

Design Issues

Some papers identified and examined issues concerning the conceptual design of AMCs, such as: (i) credibility of offer, (ii) identifying in advance the product requirements, purchase price and quantity,

(iii) handling products developed after the first entrant, (iv) susceptibility to politically-motivated influence and (v) limited to pre-selected targeted diseases and treatments (Towse and Kettler 2005; Berndt and Hurvitz 2005; Ravvin 2008). Whether the products dealt with are "technologically close" or "technologically distant" has been noted to affect the ideal design of AMCs (Kremer and Williams 2010; Kremer, Levin, and Snyder 2015)

Sonderholm (2010, 2011) argued against the AMC recommended by the CGD based on the following rationale: (i) it is demand-based, which can lead to wasting of funds on "medically inferior products" if demanded by governments for "non-medical reasons", e.g. cultural norms, instead of a similarly priced "medically superior product" in the situation of multiple licensed products (Sonderholm 2010), and (ii) it has features amounting to a "winner takes all" situation observed in prize proposals (Sonderholm 2011). Light (2005) argued that the CGD's AMC model would fail to ensure the sustainability of the supply of vaccines (Light 2005). Light (2009) also argued that the pilot AMC was in reality an "advanced purchase commitment," which did not address the need for R&D efforts for new vaccines, and maintained the status quo of strong intellectual property monopolies over medicines (Light 2009).

Implementation of Pilot AMC

In 2009, the pilot AMC for pneumococcal vaccines (PCV) was launched. It had a funding pledge amounting to USD 1.5 billion from 5 governments and the Bill and Melinda Gates Foundation (BMGF), and was implemented by GAVI, the World Bank, United Nations Children's Fund and World Health Organization. The AMC was legally binding in character, and invited vaccine producers to bid to supply a share of the annual estimated demand of 200 million doses of PCV for a period of 10 years. Chosen producers were bound to set their vaccine purchase price, paid for by GAVI and participating countries, at a maximum amount of USD 3.50 per dose, which is referred to as the "tail price." Further, for about 20% of the initial supply, the producers were additionally compensated through AMC funds in order to bring the total vaccine price to USD 7. A notable feature of the AMC was that payment would only be triggered if a vaccine was actually developed, manufactured and subsequently purchased by developing countries (Hargreaves et al. 2011). Annual reports on the pilot AMC period covering the between 2017 here: https://www.gavi.org/funding/pneumococcal-amc/. GAVI are available commissioned evaluations of the performance of the pilot AMC in 2016 as well as its process and which are available here: https://www.gavi.org/library/gavidocuments/evaluations/.

Hargreaves et al. (2011) noted that, while the AMC was originally conceptualized to promote R&D for malaria, tuberculosis and HIV vaccines, the pilot AMC focused on PCV which had either already been marketed or was about to obtain regulatory approval in the US; therefore, the AMC could facilitate access for developing countries by encouraging regulatory compliance and

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manufacturing capacity among PCV suppliers (Hargreaves et al. 2011). Cernuschi et al. (2011) discussed two challenges of the pilot AMC: encouraging effective participation among developers of first and second-generation vaccines, and dealing with uncertainties in demand and donor-reliant funding (Cernuschi et al. 2011). In conducting an initial economic evaluation of the pilot AMC, Synder, Begor, and Berndt (2011) concluded that AMCs offering higher profit margins would proportionately increase manufacturers' interest in R&D of new pharmaceutical products (Snyder, Begor and Berndt 2011).

Criticisms of Pilot AMC

The AMC has also been critiqued. Plahte (2012) provided initial findings on the impact of the pilot AMC, and concluded that the design of the AMC was unsuitable to vaccine producers from developing countries, the development of the PCV vaccines manufactured by GlaxoSmithKline (GSK) and Pfizer were not induced by the creation of the AMC and that there was a lack of evidence to back the creation of subsequent AMCs (Plahte 2012). Wilson (2010) argued that the vaccines procured through the AMC could also have been bought at a lower price with existing procurement mechanisms, i.e. through UNICEF. Médecins Sans Frontières (2011) noted that the pilot AMC was not only purchasing the vaccines from GSK and Pfizer at £2 per dose but also subsidizing each company with £137 million. MSF argued that these subsidies were unwarranted considering that these vaccines were sold in both developed and developing countries, and had long been commercially available (Médecins Sans Frontières 2011). Light (2011) argued that the AMC faced a funding challenge because that GAVI agreed to (i) decrease the co-payment amounts by the majority of eligible countries to about \$0.30 and (ii) to shoulder a "tail price ceiling" of \$3.50, which was too high (Light 2011).

Others

Some authors view the Health Impact Fund as an expanded form of AMC (Hollis 2008; Banerjee, Hollis, and Pogge 2010).

Research gaps

- Study of effectiveness of AMCs in driving early-stage and/or late-stage R&D for vaccines and other pharmaceutical products
- Analysis of AMC's ability to incentivize supplier competition and provide security of supply

Cited papers with abstracts

Banerjee, Amitava, Aidan Hollis, and Thomas Pogge. 2010. "The Health Impact Fund: Incentives for Improving Access to Medicines." The Lancet 375 (9709): 166–69. https://doi.org/10.1016/S0140-6736(09)61296-4.

Abstract: Not available

Link:https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(09)61296-4/fulltext?_eventId=login

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Barder, Owen, Michael Kremer, and Heidi Williams. 2006. "Advance Market Commitments: A Policy to Stimulate Investment in Vaccines for Neglected Diseases." The Economists' Voice 3 (3). https://doi.org/10.2202/1553-3832.1144.

Abstract: Not available

Link: https://economics.mit.edu/files/6809

Barder, Owen, Ruth Levine, and Michael Kremer. 2005. Making Markets for Vaccines: Ideas to Action: The Report of the Center for Global Development Advance Market Commitment Working Group. Washington, D.C.: Center for Global Development.

Abstract: Not available

 $\label{link:https://www.cgdev.org/sites/default/files/archive/doc/books/vaccine/MakingMarkets-complete.pdf$

Berndt, Ernst R., Rachel Glennerster, Michael R. Kremer, Jean Lee, Ruth Levine, Georg Weizsäcker, and Heidi Williams. 2007. "Advance Market Commitments for Vaccines against Neglected Diseases: Estimating Costs and Effectiveness." Health Economics 16 (5): 491–511. https://doi.org/10.1002/hec.1176.

Abstract: The G8 is considering committing to purchase vaccines against diseases concentrated in low-income countries (if and when desirable vaccines are developed) as a way to spur research and development on vaccines for these diseases. Under such an 'advance market commitment,' one or more sponsors would commit to a minimum price to be paid per person immunized for an eligible product, up to a certain number of individuals immunized. For additional purchases, the price would eventually drop to close to marginal cost. If no suitable product were developed, no payments would be made. We estimate the offer size which would make revenues similar to the revenues realized from investments in typical existing commercial pharmaceutical products, as well as the degree to which various model contracts and assumptions would affect the cost-effectiveness of such a commitment. We make adjustments for lower marketing costs under an advance market commitment and the risk that a developer may have to share the market with subsequent developers. We also show how this second risk could be reduced, and money saved, by introducing a superiority clause to a commitment. Under conservative assumptions, we document that a commitment comparable in value to sales earned by the average of a sample of recently launched commercial products (adjusted for lower marketing costs) would be a highly cost-effective way to address HIV/AIDS, malaria, and tuberculosis. Sensitivity analyses suggest most characteristics of a hypothetical vaccine would have little effect on the cost-effectiveness, but that the duration of protection conferred by a vaccine strongly affects potential cost-effectiveness.

Link: https://onlinelibrary.wiley.com/doi/abs/10.1002/hec.1176

Berndt, Ernst R., and John A. Hurvitz. 2005. "Vaccine Advance-Purchase Agreements for Low-Income Countries: Practical Issues." Health Affairs 24 (3): 653–65. https://doi.org/10.1377/hlthaff.24.3.653.

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Abstract: There are strong theoretical arguments for the creation of advance-purchase agreements to increase incentives for the development and production of vaccines for diseases concentrated in low- income countries. A Center for Global Development working group recently concluded that such agreements could be implemented successfully. We consider the practical economic and legal arrangements for such advance-purchase commitments. We identify several practical issues that we believe the public health and policy community should consider further in the design of an advance- purchase commitment.

Link: https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.24.3.653

Cernuschi, Tania, Eliane Furrer, Nina Schwalbe, Andrew Jones, Ernst Berndt & Susan McAdams. 2011. "Advance Market Commitment for Pneumococcal Vaccines: Putting Theory into Practice." Bulletin of the World Health Organization 89 (12): 913-918. https://doi.org/10.2471/BLT.11.087700.

Abstract: Markets for life-saving vaccines do not often generate the most desired outcomes from a public health perspective in terms of product quantity, quality, affordability, programmatic suitability and/or sustainability for use in the lowest income countries. The perceived risks and uncertainties about sustainably funded demand from developing countries often leads to underinvestment in development and manufacturing of appropriate products. The pilot initiative Advance Market Commitment (AMC) for pneumococcal vaccines, launched in 2009, aims to remove some of these market risks by providing a legally binding forward commitment to purchase vaccines according to predetermined terms. To date, 14 countries have already introduced pneumococcal vaccines through the AMC with a further 39 countries expected to introduce before the end of 2013.

This paper describes early lessons learnt on the selection of a target disease and the core design choices for the pilot AMC. It highlights the challenges faced with tailoring the AMC design to the specific supply situation of pneumococcal vaccines. It points to the difficulty – and the AMC's apparent early success – in establishing a long-term, credible commitment in a constantly changing unpredictable environment. It highlights one of the inherent challenges of the AMC: its dependence on continuous donor funding to ensure long-term purchases of products. The paper examines alternative design choices and aims to provide a starting point to inform discussions and encourage debate about the potential application of the AMC concept to other fields.

Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3260895/

Hargreaves, James R, Brian Greenwood, Charles Clift, Akshay Goel, Anne Roemer-Mahler, Richard Smith, and David L Heymann. 2011. "Making New Vaccines Affordable: A Comparison of Financing Processes Used to Develop and Deploy New Meningococcal and Pneumococcal Conjugate Vaccines." The Lancet 378 (9806): 1885–93. https://doi.org/10.1016/S0140-6736(11)60687-9.

Abstract: Not available

Link: https://www.sciencedirect.com/science/article/pii/S0140673611606879?via%3Dihub

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Hollis, Aidan. 2008. "The Health Impact Fund: A Useful Supplement to the Patent System?" Public Health Ethics 1 (2): 124–33. https://doi.org/10.1093/phe/phn016.

Abstract: The Health Impact Fund has been proposed as an optional, comprehensive advance market commitment system offering financial payments or 'prizes' to patentees of new drugs, which are sold globally at an administered low price. The Fund is designed to offer payments based on the therapeutic impact of the drugs or vaccines, so that innovators will have efficient incentives to develop drugs that maximize health gains. Consumers would have improved access to such drugs because of low prices.

Link: https://academic.oup.com/phe/article/1/2/124/1448943

Kremer, Michael, Jonathan Levin, and Christopher M. Synder. 2015. "Designing Advance Market Commitments for New Vaccines." presented at the Conference in honor of Eric Maskin, Harvard University, July 16. https://www.dartmouth.edu/~csnyder/AMC_Design_33.pdf.

Abstract: Advance market commitments (AMCs) have been proposed as mechanisms to stimulate investment by suppliers of products to low-income countries, where familiar mechanisms such as patents and prizes can fall short. In an AMC, donors commit to a fund from which a specified subsidy is paid per unit purchased by low-income countries until the fund is exhausted, strengthening suppliers' incentives to invest in research, development, and capacity. A \$1.5 billion pilot AMC is underway to speed the roll out of a pneumococcus vaccine to the developing world covering additional strains prevalent there.

This paper undertakes the first formal analysis of AMCs. We construct a model in which an altruistic donor bargains with a supplier on behalf of a low-income country over vaccine price and quantity ex post, after the supplier has sunk ex ante investments. We use this model to explain the broad logic of an AMC—as a solution to a hold-up problem—as well as to analyze specific features of the pilot's design that we argue enhance its efficiency. We study a variety of design features including capacity forcing, supply commitments, price ceilings, and accrued interest, and consider a variety of economic environments including competing suppliers, competing demand from middle-income countries outside the program. We show that optimal AMC design differs markedly depending on where the product is in its development cycle.

Link: https://www.dartmouth.edu/~csnyder/AMC_Design_33.pdf

Kremer, Michael, and Heidi Williams. 2010. "Incentivizing Innovation: Adding to the Tool Kit." Innovation Policy and the Economy 10 (January): 1–17. https://doi.org/10.1086/605851.

Abstract: Not available

Link: https://economics.mit.edu/files/6807

Light, Donald W. 2005. "Making Practical Markets for Vaccines." PLoS Medicine 2 (10): e271. https://doi.org/10.1371/journal.pmed.0020271.

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Link:https://www.who.int/intellectualproperty/submissions/CGD-PLOS-Light-10%201371_journal%20pmed%200020271-p-L.pdf

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Abstract: Not available

Link:https://www.researchgate.net/publication/238798568_Advanced_Market_Commitments_ Current_Realities_and_Alternate_Approaches

Light, Donald W. 2011. "Saving the Pneumococcal AMC and GAVI." Human Vaccines 7 (2): 138–41. https://doi.org/10.4161/hv.7.2.14919.

Abstract: Not available

Link: https://www.tandfonline.com/doi/abs/10.4161/hv.7.2.14919

Médecins Sans Frontières. 2011. "GAVI Money Welcome But Could It Be More Wisely Spent?" Médecins Sans Frontières. June 14, 2011. https://www.msf.org/gavi-money-welcome-could-it-be-more-wisely-spent.

Abstract: Not Available

Link: https://www.msf.org/gavi-money-welcome-could-it-be-more-wisely-spent

Plahte, Jens. 2012. "Is the Pneumococcal Vaccine Advance Market Commitment Motivating Innovation and Increasing Manufacturing Capacity? Some Preliminary Answers." Vaccine 30 (14): 2462–66. https://doi.org/10.1016/j.vaccine.2012.01.046.

Abstract: This paper seeks to give some preliminary evidence on the potential outcome of the pneumococcal vaccine Advance Market Commitment (AMC), with a focus on its impact on innovation in 'emerging' vaccine manufacturers in developing countries.

The evidence is derived from a series of interviews with executives at industrial vaccine developing organizations with pneumococcal vaccines in their R&D portfolio, including both multinational pharmaceutical companies and 'emerging' manufacturers.

The main findings are that so far there is no evidence to support any claim that the AMC is speeding innovation of pneumococcal vaccines, or that it is contributing to productive capacity expansion. Representatives of emerging manufacturers consistently state that the AMC is either irrelevant or inappropriate for supporting their innovative activities on pneumococcal vaccines.

Link: https://www.sciencedirect.com/science/article/pii/S0264410X12000849?via%3Dihub

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Ravvin, Michael. 2008. "Incentivizing Access and Innovation for Essential Medicines: A Survey of the Problem and Proposed Solutions." Public Health Ethics 1 (2): 110–23. https://doi.org/10.1093/phe/phn017.

Abstract: The existing intellectual property regime discourages the innovation of, and access to, essential medicines for the poor in developing countries. A successful proposal to reform the existing system must address these challenges of access and innovation. This essay will survey the problems in the existing pharmaceutical patent system and offer critical analysis of some reform proposals. I will argue that existing mechanisms that are intended to mitigate the harms of the current pharmaceutical patent system, such as bulk buying, differential pricing and compulsory licenses, are inadequate and perhaps even counter-productive over the long-term. Other incentive mechanisms based on push funding, such as government research grants, are inefficient and limited in scope. Pull mechanisms, which offer some reward for successful pharmaceutical innovations, offer a more promising incentive mechanism. I will evaluate three pull mechanisms -- Priority Review Vouchers, Advance Market Commitment (AMC) and the Health Impact Fund -- on the basis of their capacity to incentivize access and innovation, as well as their efficiency and political feasibility. Though the Health Impact Fund appears to be the most promising proposal, more work must be done to overcome challenges of its implementation.

Link: https://academic.oup.com/phe/article/1/2/110/1449014

Snyder, Christopher M., Wills Begor, and Ernst R. Berndt. 2011. "Economic Perspectives on the Advance Market Commitment for Pneumococcal Vaccines." Health Affairs 30 (8): 1508–17. https://doi.org/10.1377/hlthaff.2011.0403.

Abstract: Pharmaceutical companies have long been reluctant to invest in producing new vaccines for the developing world because they have little prospect of earning an attractive return. One way to stimulate such investment is the use of an advance market commitment, an innovative financing program that guarantees manufacturers a long-term market. Under this arrangement, international donors pay a premium for initial doses sold to developing countries. In exchange, companies agree to continue supplying the vaccine over the longer term at more sustainable prices. This article provides a preliminary economic analysis of a pilot advance market commitment program for pneumococcal vaccines, explaining the principles behind the program's design and assessing its early performance. Spurred by the advance market commitment—and other contemporaneous initiatives that also increased resources to vaccine suppliers—new, second-generation pneumococcal vaccines have experienced a much more rapid rollout in developing countries than older first-generation vaccines.

Link:https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2011.0403?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed

Sonderholm, Jorn. 2010. "A Theoretical Flaw in the Advance Market Commitment Idea." Journal of Medical Ethics 36 (6): 339–43. https://doi.org/10.1136/jme.2009.033092.

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on innovation and access to medicines

Abstract: Infectious and parasitic diseases cause massive health problems in the developing world. Research and development of drugs for diseases that mainly affect poor people in developing countries is limited. The advance market commitment (AMC) idea is an incentivising mechanism for research and development of drugs for neglected diseases. Discussion of the AMC idea is of renewed interest given the launch in June 2009 of the first AMC. This pilot AMC is designed to, among other things, test the idea for potential future applications. This paper is a critique of the AMC idea. It seeks to show that the idea has a hitherto unrecognised theoretical flaw that should make policy-makers and donors hesitant to embrace future applications of the idea.

Link: https://jme.bmj.com/content/36/6/339

Sonderholm, Jorn. 2011. "Advance Monopoly Commitment?" Public Health Ethics 4 (3): 297–302. https://doi.org/10.1093/phe/phr012.

Abstract: This article is a critical discussion of the Advance Market Commitment (AMC) proposal for how to incentivize research and development of drugs for neglected diseases. The main claim of the article is that the 'winner-takes-all' problem that mars a simple prize proposal for how to incentivize research and development of drugs for neglected diseases also tarnishes the AMC proposal. The conclusion of the article is that the AMC proposal should be rejected as an incentivizing scheme for research and development of drugs for neglected diseases. This conclusion follows from the main claim of the article together with two plausible assumptions that are not argued for in the article.

Link: https://academic.oup.com/phe/article/4/3/297/1500194

Towse, Adrian and Hannah Kettler. 2005. "Advance Price or Purchase Commitments to Create Markets for Treatments for Diseases of Poverty: Lessons from Three Policies." Bulletin of the World Health Organization 83(4): 301-7.

Abstract: New drugs and vaccines are needed for tackling diseases of poverty in low- and middle- income countries. The lack of effective demand or market for these products translates into insufficient investment being made in research and development to meet the need for them. Many have advocated cost-reducing (push) and market-enhancing (pull) incentives to tackle this problem. Advance price or purchase commitments (APPCs) funded by international agencies and governments offer one way forward. This paper looks at design issues for APPCs for drugs and vaccines for diseases of poverty drawing on experience and lessons from three case studies: the introduction of the meningitis C vaccine in the United Kingdom; the Orphan Drug Act (ODA) in the United States of America (US); and the newly legislated US Project BioShield for bioterrorist interventions. Our key conclusion is that that APPCs have the potential to be a powerful tool and should be tried. The correct structure and design may only be determined through the process of taking action to set one up.

Link: http://apps.who.int/medicinedocs/documents/s22157en/s22157en.pdf

Wilson, Paul. 2010. "Giving Developing Countries the Best Shot: An Overview of Vaccine Access and R&D." Oxfam International Médicins Sans Frontières.

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https://www.oxfam.org/sites/www.oxfam.org/files/giving-developing-countries-best-shot-vaccines-2010-05.pdf.

Abstract: Not available

Link:https://www.oxfam.org/sites/www.oxfam.org/files/giving-developing-countries-best-shot-vaccines-2010-05.pdf

- * For the purposes of this review, we have established three categories to describe the state of the literature: thin, considerable, and rich.
- Thin: There are relatively few papers and/or there are not many recent papers and/or there are clear gaps
- Considerable: There are several papers and/or there are a handful of recent papers and/or there are some clear gaps
- Rich: There is a wealth of papers on the topic and/or papers continue to be published that address this issue area and/or there are less obvious gaps

Scope: While many of these issues can touch a variety of sectors, this review focuses on medicines. The term medicines is used to cover the category of health technologies, including drugs, biologics (including vaccines), and diagnostic devices.

Disclaimer: The research syntheses aim to provide a concise, comprehensive overview of the current state of research on a specific topic. They seek to cover the main studies in the academic and grey literature, but are not systematic reviews capturing all published studies on a topic. As with any research synthesis, they also reflect the judgments of the researchers. The length and detail vary by topic. Each synthesis will undergo open peer review, and be updated periodically based on feedback received on important missing studies and/or new research. Selected topics focus on national and international-level policies, while recognizing that other determinants of access operate at sub-national level. Work is ongoing on additional topics. We welcome suggestions on the current syntheses and/or on new topics to cover.

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