A New Incentive for Neglected Disease Drug Development: Generic Drug Repurposing Pull Mechanism

Policy Memo

Introduction

Drug development for neglected diseases (NDs) is a persistent global health challenge, leaving gaps in medical treatment for some of the world's poorest populations. Firms lack incentives to develop therapies for NDs because of the poor commercial markets in lower-income countries and limited ability to recoup their costs of investment. Philanthropic and government funding and incentive programs have previously been established to help address this challenge, but funding for NDs has been trending downward since 2018. Generic drug repurposing – conducting research on existing generic drugs for new uses – may offer a cheaper, faster pathway for drug development for NDs. Since drugs targeted for repurposing have already been proven safe in people through clinical trials, developers may be able to bypass some of the earlier stages of testing and focus on demonstrating the drug's efficacy for the new indication. Repurposing generic drugs also has benefits in that they are typically cheaper and already widely available.

Insufficient incentives

Despite the benefits of generic drug repurposing, developers are not interested in conducting studies on existing drugs for new indications once generic competitors enter the market. When generics become available, a drug's price is lowered substantially – about 80% lower than the brand name within 5 years.[i] This reduces the firm's ability to recoup costs of R&D from researching additional uses and limits its profit margins. Firms therefore lack incentives to invest in additional research on the drug. Creating incentives for generic drug repurposing can address this market failure. Most current approaches rely on push funding, such as research grants, but this approach selects a "winner" for the funds in advance. However, firms often have private information about potential new uses of drugs that funders may not be aware of. Therefore, pull funding may be a complementary strategy since it does not pre-select winners, but rather rewards any firm that successfully discovers new uses.

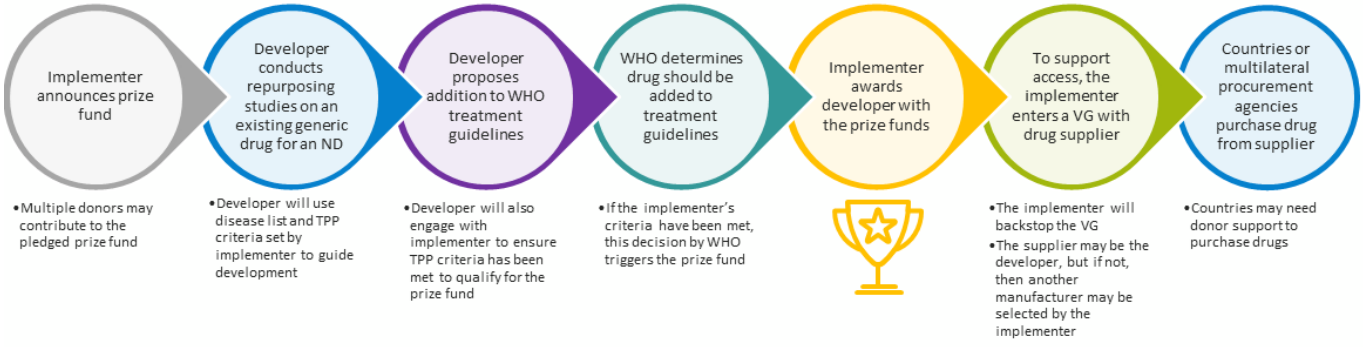
It is worth noting that the priority review voucher (PRV) is an important pull incentive program already in place for ND drug development. However, the program only applies to innovative drugs and does not reward drug repurposing. This leaves untapped potential in existing generic drugs as therapies for NDs.

Solution description

We propose a pull incentive mechanism with the following design characteristics:

- The reward will take the form of a cash prize paid out in a single lump sum payment upon achieving success.
- The prize will be paid to the firm that conducts the repurposing studies and achieves success.
- Success will be defined as inclusion on WHO treatment guidelines or regulatory approval for the new indication by a WHO Listed Authority.
- The mechanism will reward repurposing for a defined list of neglected diseases.
- To encourage greater access to the repurposed drug, in addition to the prize fund, the funder will broker and backstop a volume guarantee with a WHO prequalified manufacturer to support access in affected countries.

The process will look like this:



Benefits and costs analysis

The reward amount paid to the firm must be large enough to attract firms' investments, but also reasonable for the funder and not exceeding the value of the drug. We first estimated the 'necessary reward amount' to attract firms by considering the cost of trials, risk of failure, and expected rate of return. However, we also want to scale the payments to reflect the value, or health impact, of the repurposed drug. We do this by linking the reward total to disability adjusted life years (DALYs) averted. Depending on the drug's effectiveness for the new indication, this may be more or less than the 'necessary reward amount'. Higher value drugs, though, may result in excessive reward payments, and we therefore proposed a limit to ensure a reasonable cost to the funder while still recognizing the value of the drug. Firms could therefore be rewarded **up to $200 million** per repurposed drug.

We also want to determine that the benefits of a reward for generic drug repurposing would justify the costs (i.e., reward payment and monitoring costs). To calculate benefits, we measured health impact from a repurposed generic drug in DALYs averted and the resulting societal economic gains for three example diseases: dengue, malaria, and tuberculosis. Analyzing the costs and benefits together, we determined that for every $1 invested by the funder in simple repurposed drugs, societal returns would amount to would amount to the following per disease:

Disease/Condition	Societal returns per $1 invested
Dengue	$221.50
Malaria	$1972.40
Tuberculosis	$642.90

Funding options

Funding and implementing this mechanism, like most global health efforts, will require a coordinated partnership among multiple stakeholders. Public and philanthropic donors are the most likely funders, and a group of donors could pool funds for the prize fund. The prize fund will be managed by the implementer. The implementer should be one of the donors who is best positioned to foster partnership, provide support to developers, act as guarantor for a volume guarantee, and engage with partners to generate demand for the drug.

[i] Informatics II for H. *Price Declines after Branded Medicines Lose Exclusivity in the U.S Introduction*.; 2016.