How can supply of penicillin be an issue in any country in 2013?

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Benzathine penicillin G (BPG) is the most essential antibiotic for the treatment and prevention of group A streptococcal infections associated with rheumatic fever and rheumatic heart disease. Yet while some countries such as South Africa and Brazil have stable supplies, most countries with a high RHD burden often suffer interruptions in supply and also have quality control issues. The problems around supply of this drug are discussed in one of the papers of the RHD special issue of *Global Heart*, the journal of the World Heart Federation. The paper is by Dr Rosemary Wyber, Telethon Institute for Child Health Research, Centre for Child Health Research, The University of Western Australia, Perth, Australia and colleagues.

Secondary prophylaxis is used to prevent cases of rheumatic fever developing into full blown RHD, and requires monthly injections of BPG for at least 10 years, although for some severe cases lifelong prophylaxis is required. Delivering each injection in secondary prophylaxis regimes is a global challenge. In most setting fewer than eighty percent of scheduled injections are delivered (the only country that routinely achieves >80% is New Zealand). Most countries probably achieve only the minority of injections, significantly increasing the risk of acute rheumatic fever (ARF).

The authors highlight that despite many of the world's poorest countries being able to supply their populations with HIV medications for those infected, these same countries can struggle to supply BPG, a drug that has been around for decades. BPG is considered an essential medicine

by the World Health Organization, yet erratic supply means it is often unavailable to the impoverished people relying on it to prevent the progression of RHD.

One of the issues possibly causing supplies of BPG to be intermittent is its dwindling potential to be used for other conditions such as syphilis, which now can be largely treated with other drugs. The authors add: "As rheumatic heart disease has receded as a public health priority in most high-income settings, attention to the supply, manufacture, and accessibility of BPG has declined. Concerns about the quality, efficacy, and innovation of the drug have emerged following plasma analysis and anecdotal reports from low-resource settings."

Issues around actual administration of the drug include pain while injecting—in some programs local anaesthetic is routinely used as a diluent for BPG to reduce injection pain. Unexpectedly high rates of severe allergy and anaphylaxis have also made secondary prophylaxis programs difficult. Generally accepted international data suggests that the incidence of allergic reactions to monthly BPG injection is 3.2% and anaphylactic reactions is 0.2%. However, episodes of anaphylaxis in India have seen BPG injections outlawed in some states.

The authors say: "An implantable or longer acting BPG delivery device would be a more appropriate and acceptable mechanism for delivering secondary prophylaxis." They advocate ongoing research into novel delivery devices, partnerships with industry, market shaping interventions and procurement support to improve supply. Dr Wyber summarises "Making this essential medicine available to vulnerable populations is the most important step in reducing death and disability from RHD. Researchers, industry, governments and communities need to commit to delivering this low cost, life changing intervention".

The authors conclude: "Securing and delivering high-quality supplies of

BPG is a surmountable challenge; powdered formulations are off-patent, fixed-dose, do not require a cold chain, and demand can be forecast in predictable volumes for many years. In comparison to the complexities of early antiretroviral regimes and vaccination efforts, universal access to BPG is eminently achievable...Global institutional leadership will be required to move forward on priority issues for improving access."

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