

Could Netflix Based Subscription Models Tackle the Shrinking Antibiotics Pipeline?

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Introduction/Objective

- ▶ After a boom of antibiotic discovery between the mid-1940s and 1980, the discovery of new antibiotics has been largely void in the last 40 years.¹
- ▶ Concerns have been growing over the limited number of antibiotics in the clinical pipeline as antibiotic resistance is an ever-increasing issue.²
- ▶ One barrier to discovery is the poor revenue that antibiotics bring to manufacturers, as price and volume potential is low and new antibiotics are typically only used after earlier lines have proved ineffective. Governments around the world are looking to incentivise novel antibiotic discovery.
- ▶ One way in which this is being trialled is with subscription-based or “Netflix” style pricing models. Such models allow manufacturers to be reimbursed for a fixed “subscription” fee irrespective of the volume of the drug that is used for a fixed time period.
- ▶ To understand how subscription-based models could address the growing concern of a shrinking antibiotic pipeline, we identified agreements of this type for antibiotics in Europe, along with other therapy areas in the rest of the world, and assessed whether their implementation has coincided with an increase in antibiotic clinical development.

Methods

- ▶ Antibiotics and antibacterials assessed by the European Medicines Agency (EMA) since its formation in 1995 were filtered, removing withdrawn or generic applications, and submissions per year were counted.
- ▶ Subsequently, European antibiotic subscription-based models were identified from national reimbursement agencies.
- ▶ Finally, pipeline antibiotics and antibacterials were visualised over time by analysing World Health Organisation (WHO) data on substances in pre-clinical development since 2019 and clinical development since 2017, which is when records began.

Results

- ▶ Since 1995, 21 new antibiotics or antibacterials have been approved by the EMA (Figure 1).
- ▶ There was a peak in approval of antibacterials and antibiotics in 2015 following the discovery of a new class of antibiotics (Figure 1).³

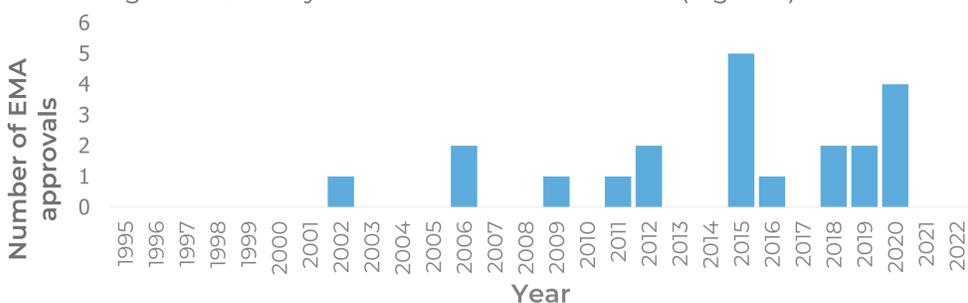


Figure 1: Number of antibiotics and antibacterials approved by the EMA per year since 1995³

- ▶ Two European countries were identified which have used subscription-based models to incentivise antibiotic and antibacterial development (Table 1).
- ▶ The UK announced in 2022 that two antibiotics will enter this type of model and Sweden has been trialling this model for five antibiotics since 2018.^{4,5}

Table 1: Subscription-based models identified for antibiotics in Europe^{4,5}

Country	Product	Manufacturer	Year Initiated
UK	Avycaz	Pfizer	2022
UK	Fetroja	Shinogi	2022
Sweden	Zerbaxa	MSD	2018
Sweden	Recarbrio	MSD	2018
Sweden	Fetroja	Shinogi	2018
Sweden	Vaborem	Pharmaprim	2018
Sweden	Fosdomycin infectopharm	Unimedica Parma	2018

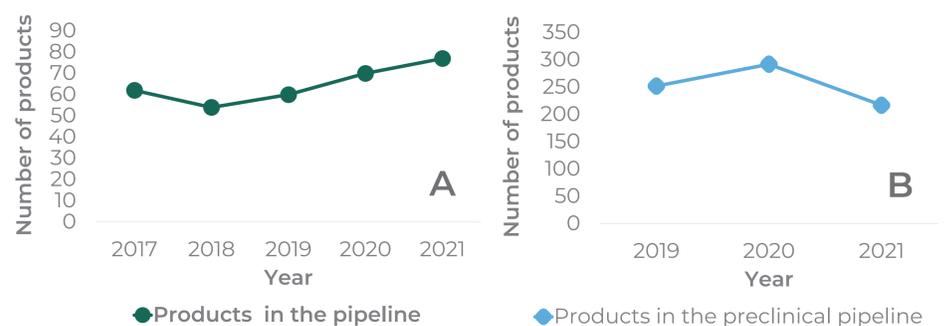
- ▶ Outside of Europe, Netflix-style pricing models were identified in Australia and via Medicaid in the states of Washington and Louisiana in the US, all for the treatment of hepatitis C (Table 2).^{6,7}

Table 2: Subscription-based models identified worldwide excluding Europe for hepatitis C^{6,7}

Country	Product	Manufacturer	Year Initiated
US	Mavyret	AbbVie	2019
US	Epclusa	Gilead	2019
Australia	Sovaldi	Gilead	2015
Australia	Epclusa	Gilead	2017
Australia	Harvoni	Gilead	2016
Australia	Viekirax Pak	AbbVie	2017
Australia	Zepatier	Mereck	2017
Australia	Daklinza	BMS	2017
Australia	Viekirax Pak + ribavirin	AbbVie	2017

- ▶ WHO data show an upward trend in antibiotic and antibacterial products in the clinical development pipeline since 2017 (Figure 2A).⁸
- ▶ Data from the preclinical development pipeline were available from 2019, but do not show an increase in number (Figure 2B).⁸

Figure 2: Number of antibiotics and antibacterials products in the clinical (A) or preclinical (B) development pipeline⁸



Discussion and Conclusion

- ▶ Antibiotic resistance is a global concern which has sparked some governments to incentivise antibiotic/antibacterial research and development. Though subscription-based models for antibiotics/antibacterials correlate with an increase in the number in clinical development, it is unclear if this will translate into more antibiotics coming to market, whether the increase will be sustained, or is indeed if it is as a result of the recent incentives.
- ▶ Nevertheless, guaranteed revenue following successful negotiation is likely favourable to manufacturers when development in this area had previously been non-viable. However, both manufacturers and payers may be cautious of these agreements. If epidemiological data are underestimated, manufacturers could receive a very low price per unit. For payers, if long-term health benefits are not realised, they may be tied into a long-term contract.
- ▶ Subscription-based models are also used for hepatitis C in Australia and in some US states via Medicaid to allow greater coverage for expensive treatments, which differs from the motives seen for antibiotics. We speculate that subscription-based models may expand into therapy areas with uncertainty over patient numbers or frequency of treatment. However, they may only be feasible in single-payer markets in therapy areas perceived as national future health threats.
- ▶ Other innovative incentives are also being proposed for antibiotics in Europe, namely a voucher scheme named the “Transferable Exclusivity Extension” which would provide extended exclusivity to a drug of the manufacturers choice following the approval of an antibiotic.⁹

Abbreviations: BMS: Bristol-Myers Squibb; EMA: European Medicines Agency; MSD: Merck Sharp & Dohme; R&D: Research and Development; WHO: World Health Organisation

References: 1 - Silver LL. *Clin Microbiol Rev.* 2011 Jan;24(1):71-109; 2 - Butler MS et al. *Antimicrob Agents Chemother.* 2022 Mar 15;66(3):e01991; 3 - EMA. *European public assessment reports.* shorturl.at/stU89. Accessed 23rd Sept 2022; 4 - gov.uk. *Development of new antibiotics encouraged with new pharmaceutical payment system.* shorturl.at/aly6. Accessed 23rd Sept 2022; 5 - Folkhalsomyndigheten. *Availability of antibiotics.* shorturl.at/CDG13. Accessed 23rd Sept 2022; 6 - Moon S et al *N Engl J Med.* 2019;380(7):607-610; 7 - Harry H et al. *RAND Corp.* 2020; 8 - WHO; *Antibacterial agents in clinical and preclinical development: an overview and analysis;* shorturl.at/hnST3. Accessed 23rd September 2022; 9 - EFPIA. shorturl.at/cjstQ. Accessed 10th October 2022.