

Global timing of hepatitis C virus elimination in high-income countries: an updated analysis

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Presented at the European Association for the Study of the Liver's 55th Annual International Liver Congress, August 25–28, 2020, London, United Kingdom

INTRODUCTION

- The elimination of hepatitis C virus (HCV) by 2030, as set out by the World Health Organization (WHO),¹ may be attainable with the availability of highly efficacious HCV therapies.
- It has been previously shown² that most high-income countries are not on track to meet the WHO's targets that would eliminate HCV as a public health threat by 2030.

OBJECTIVE

- This study updates a previously published analysis,² with 2019 data, on the timing of HCV elimination in 45 high-income countries based on the WHO's 2030 HCV elimination targets¹ for incidence, mortality, diagnosis, and treatment.

METHODS

- Previously published Markov disease progression models³ of HCV infection for 45 high-income countries, accounting for 98% of the population in the world's high-income economies,⁴⁻⁵ were updated with the latest available demographic data⁵ and calibrated to the latest available chronic HCV prevalence data.⁶
- The country models were updated with the number of annual new diagnoses (with reported data over 2017–2018)⁶ and treatments (with reported and projected data over 2017–2019)⁶ for HCV infection.
- The latest reported or projected levels of diagnosis and treatment were defined as baseline and optimistically assumed to stay constant in the future.
- Incidence was modeled as a function of total infections.
- Modeled outcomes until 2050 were analyzed to determine the year in which each country would meet the WHO's HCV elimination targets for the reduction in incidence (80%) and mortality (65%), and diagnosis (90%) and treatment (80%) coverage relative to 2015 levels
- The earliest year in which all four targets were met was defined as the year of HCV elimination.
- The years of elimination by country were compared to the previously published estimates.²

RESULTS

- Of the 45 high-income countries studied, 11 (Australia, Canada, France, Germany, Iceland, Italy, Japan, Spain, Sweden, Switzerland, and the United Kingdom) are on track to meet the WHO's HCV elimination targets by 2030 (Table 1, Figure 2).
- Five countries (Austria, Malta, Netherlands, New Zealand, and South Korea) are expected to achieve HCV elimination by 2040, and one country (Saudi Arabia) by 2050.
- The remaining 28 countries are not expected to achieve HCV elimination before 2050.

DISCUSSION

- Of the countries previously considered off track towards HCV elimination by 2030, three (Canada, Germany, and Sweden) are now on track (Figure 1).
 - Canada's progress is driven by elimination efforts in two of its most populous provinces (British Columbia and Ontario).⁷
 - Germany's progress is driven by improved diagnosis levels since 2017.^{2,8-9}
 - Sweden has removed restrictions on treatment by fibrosis score since 2017.¹⁰
- Of the countries previously considered on track to eliminate HCV by 2030, one (South Korea) is now off track due to falling treatment levels and the lack of comprehensive screening programs.
- Among countries on track to eliminate HCV by 2030, Australia, France, Iceland, Italy, Japan, Spain, Switzerland and the United Kingdom all have HCV-specific national strategies, regional or national guidelines, national expert advisory groups, and decentralization of HCV screening.¹¹
- Most (30) countries saw no change since the previous analysis, with eight expecting an earlier time to HCV elimination, and seven expecting a later one.
- Eleven countries (24%) still had treatment restrictions by fibrosis level, and none were expected to eliminate HCV before 2050.
- The number of countries that are not expected to meet each HCV elimination target individually by 2030 are: 33 for incidence reduction, 30 for mortality reduction, 25 for treatment coverage and for 20 diagnosis coverage.

RESULTS

Table 1. Progress towards the WHO's 2030 HCV elimination targets in high-income countries

Country	Year in which the WHO's 2030 target will be met				Annual treatments necessary to achieve WHO's 2030 treatment target	Restriction on treatment by fibrosis score, 2019	Year of elimination
	Incidence	Mortality	Diagnosis	Treatment			
Australia	2028	2027	2016	2023	6,600	No	2028
Austria	2033	2024	2028	2023	550	No	2033
Bahrain	2048	–	–	–	1,100	Yes	–
Belgium	2041	–	2029	–	3,900	No	–
Canada	2030	2029	2022	2028	9,900	No	2030
Chile	–	–	–	–	2,400	Yes	–
Cyprus†	2040	–	–	–	210	Yes	–
Czechia	–	–	2045	–	3,100	Yes	–
Denmark	2037	–	2030	2041	1,100	No	–
Estonia	2039	–	–	–	990	Yes	–
Finland	–	–	2016	2049	1,200	No	–
France	2025	2024	2016	2021	4,000	No	2025
Germany	2026	2030	2028	2029	9,900	No	2030
Greece	–	–	2028	–	6,200	No	–
Hong Kong	–	–	2045	–	1,100	No	–
Hungary	–	–	2042	–	2,800	No	–
Iceland	2021	2019	2016	2017	†	No	2021
Ireland	–	–	2039	2037	1,600	No	–
Israel	2033	–	–	–	6,200	No	–
Italy	2028	2024	2029	2029	40,600	No	2029
Japan	2027	2025	a	a	–	No	2027
Kuwait†	–	–	2040	–	1,400	No	–
Latvia	–	2025	2023	2045	2,100	Yes	–
Lithuania	–	–	2040	–	1,800	Yes	–
Luxembourg	–	–	2032	2041	270	No	–
Malta	2033	2038	2015	2027	50	No	2038
Netherlands	2032	2035	2025	2025	630	No	2035
New Zealand	2038	2030	2033	2027	2,200	No	2038
Norway	2043	–	2025	2029	910	No	–
Oman	–	–	2038	–	940	No	–
Poland	–	–	2047	2030	8,400	No	–
Portugal	2042	–	–	2030	2,200	No	–
Qatar	2042	–	2027	–	2,100	Yes	–
Saudi Arabia	2041	2045	2034	2029	4,700	No	2045
Singapore	2042	–	2031	–	920	Yes	–
Slovakia	–	–	–	–	2,100	Yes	–
Slovenia	–	–	2029	–	350	No	–
South Korea	2026	2033	2030	2034	12,200	No	2034
Spain	2021	2020	2021	2020	3,800	No	2021
Sweden	2024	2022	2016	2020	950	No	2024
Switzerland	b	2024	2025	2024	1,500	No	2025
Taiwan	2042	2041	2041	–	30,700	No	–
United Arab Emirates	–	–	2029	–	7,600	No	–
United Kingdom	2030	2030	2025	2024	6,100	No	2030
United States	–	2023	2025	2027	112,000	Yes	–

WHO: World Health Organization; HCV: hepatitis C virus; –: elimination target was not met by 2050; †: epidemiological inputs of the model were based on regional data; ‡: treatment target has already been achieved
 a: Due to high all-cause and liver-related mortality among the HCV-infected population, caused by an older prevalent population, the diagnosis and treatment targets were excluded while assessing the year of elimination
 b: Due to inclusion of HCV-infected immigrants as the primary source of prevalence, the incidence target was excluded while assessing the year of elimination;

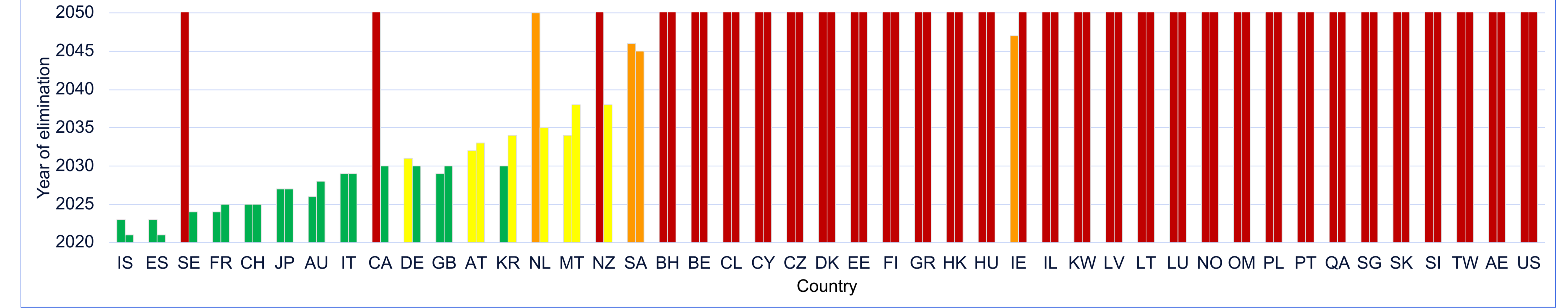
CONCLUSIONS

- Assuming high-income countries will maintain their current levels of diagnosis and treatment, only 24% are on track to eliminate HCV by 2030 and 62% are off track by at least 20 years.
- If current levels of diagnosis and treatment continue falling, achieving the WHO's 2030 HCV elimination targets will be even more challenging.
- With ten years remaining to meet WHO targets, expansion of screening and treatment is crucial to make HCV elimination possible.

LIMITATIONS

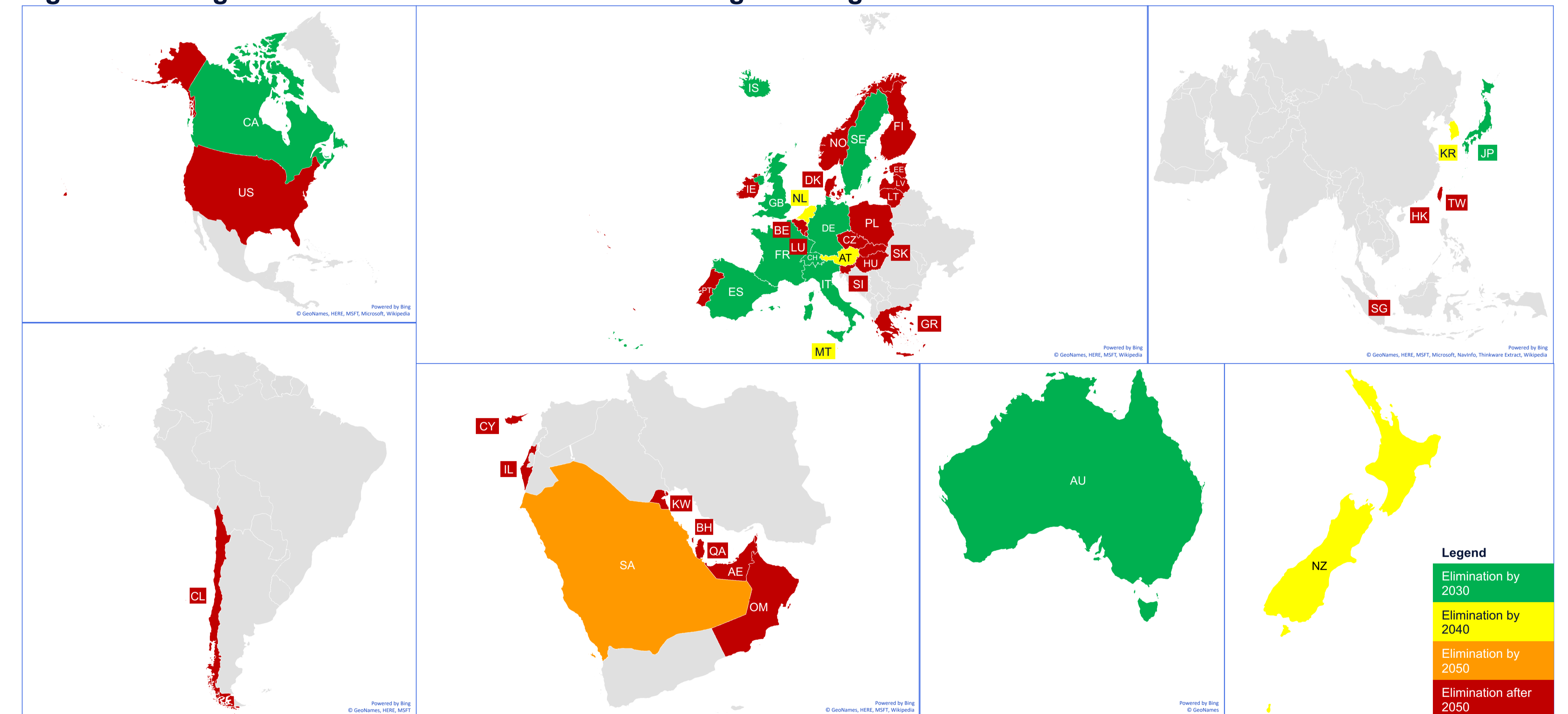
- For consistency with the previous analysis² used as the comparator, the WHO's 2030 HCV elimination target for incidence was assumed to be 80%. As the current incidence target is 90%,¹ results based on this more stringent threshold may be less optimistic.
- Latest reported diagnosis and treatment data were not available for all countries.
- Annual incident cases of acute HCV infection were inferred through a calibration procedure.

Figure 1. Progress towards the WHO's 2030 HCV elimination targets in high-income countries



The first bar represents the year of elimination at the 2017 status quo; the second bar, at the 2019 status quo

Figure 2. Timing of the WHO's 2030 HCV elimination targets in high-income countries



WHO: World Health Organization; HCV: hepatitis C Virus
 AE: United Arab Emirates; AT: Austria; AU: Australia; BE: Belgium; BH: Bahrain; CA: Canada; CH: Switzerland; CL: Chile; CY: Cyprus; CZ: Czechia; DE: Germany; DK: Denmark; EE: Estonia; ES: Spain; FI: Finland; FR: France; GB: United Kingdom; GR: Greece; HK: Hong Kong; HU: Hungary; IE: Ireland; IL: Israel; IS: Iceland; IT: Italy; JP: Japan; KR: South Korea; KW: Kuwait; LT: Lithuania; LU: Luxembourg; LV: Latvia; MT: Malta; NL: Netherlands; NO: Norway; NZ: New Zealand; OM: Oman; PL: Poland; PT: Portugal; QA: Qatar; SA: Saudi Arabia; SE: Sweden; SG: Singapore; SI: Slovenia; SK: Slovakia; TW: Taiwan; US: United States

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TRANSPARENCY

Author Disclosures
Homie Razavi is an employee of Center for Disease Analysis (CDA). CDA has received funding from AbbVie Inc. for this project. CDA has also received research funding from AbbVie, Gilead, and Intercept.
Jean-Michel Pawlotsky has received grants from Abbott, AbbVie Inc., and Gilead. He has also received consulting fees from AbbVie Inc., Gilead, Merck, and Abbott
Jeffrey V Lazarus has received consulting fee and grants from AbbVie, Gilead Sciences and MSD as well as consulting fees from GSK, Intercept and Janssen.
Jordan Feld has received consulting fees from AbbVie Inc., Enanta, Gilead, Janssen and Roche. He also received research support from AbbVie Inc., Abbott, Gilead, Janssen and Wako/Fujifilm.
Yanjun Bao, Ana Gabriela Pires dos Santos and Yuri Sanchez Gonzalez are employees of AbbVie Inc. and may own AbbVie stock or stock options.
Stefan Zeuzem has received lecture honoraria and consulting fees from AbbVie Inc., Gilead, Intercept, Janssen, and Merck/MSD.

Role of author and sponsor
 Financial support for this study was provided by **AbbVie**. AbbVie participated in the interpretation of data, review, and approval of the publication. All authors contributed to the development of the publication and maintained control over the final content.

Acknowledgment of contributors
 Medical writing support was provided by **Ivane Gamkrelidze**, an employee of the Center for Disease Analysis, who contributed to the data analysis and/or the drafting of the publication. AbbVie Inc. provided funding for this support.

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