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Global Health
Advisors**

Investment case for HCV scale-up

Full investment case narrative:

- HCV affects off 2.5 million people in Indonesia
- Without DAA scale-up, 1 M people will die and 15 M will suffer from severe liver disease between now and 2040
- The faster Indonesia scales DAA access, the more deaths and advanced liver disease can be averted
- Achieving Elimination by 2040 will prevent ~1 M new infections and by 2040 will prevent 240,000 cases of cirrhosis and decompensated cirrhosis per year
- Gradual Elimination 2040 can cost as little as USD 290 M in the next 5 years and is projected to cost USD 4.3B through 2040
- DAA and VL price reductions must be secured, with a potential to reduce total costs by 60%
- This elimination strategy would save 700 M to the health sector from preventing advanced liver disease
- Thus, for only a maximum of USD 3.6 B and as low as USD 1.4 B, Indonesia will save over 300,000 lives. A cost-effectiveness ratio at the most of USD 12,000 per life saved
- Elimination by 2040 is possible and the benefits are too great to be ignored

Indonesia has one of the highest number of HCV infections in the world with more than 1.8 M chronically infected individuals

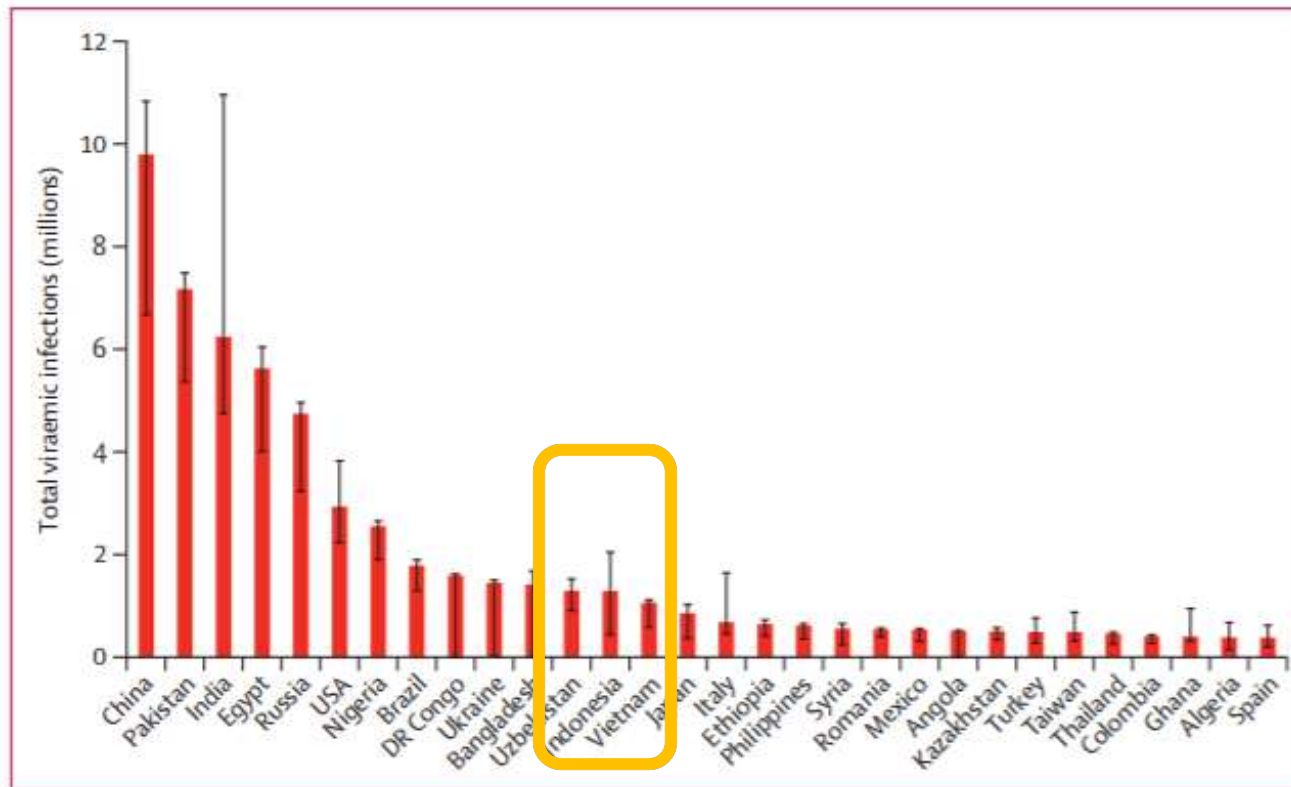


Figure 2: Countries accounting for 80% of the total viraemic HCV infections
HCV=hepatitis C virus.

Source: Blach et al. The Lancet. 2017

HCV continues to cause suffering among Indonesians, particularly key populations

- [work with Caroline to see what estimates to highlight]

Indonesia has yet to launch a large-scale national treatment program, but there is growing momentum to do so



- Updated HCV clinical guidelines have been developed
- Key DAAs have been registered and approved
- PKNI has supported large-scale awareness and provider trainings
- With the support of CHAI, the government has committed to putting 6,000 patients on treatment through the “Quick Start” program in 10 hospitals in Jakarta. CHAI has imported Daclatasvir for 2,000 patients to date
- The government has been open to discussing scale-up prospects with all stakeholders

Launching a large scale treatment effort will require both political commitment and planning

- ✓ Verbal commitment to elimination
- ✓ Government to develop a five-year strategic plan based on DAAs
- ✓ Epidemiological modelling and treatment targets to be set
- ✓ The total costs of the plan to be determined
- ✓ Additional funds to be allocated to hepatitis

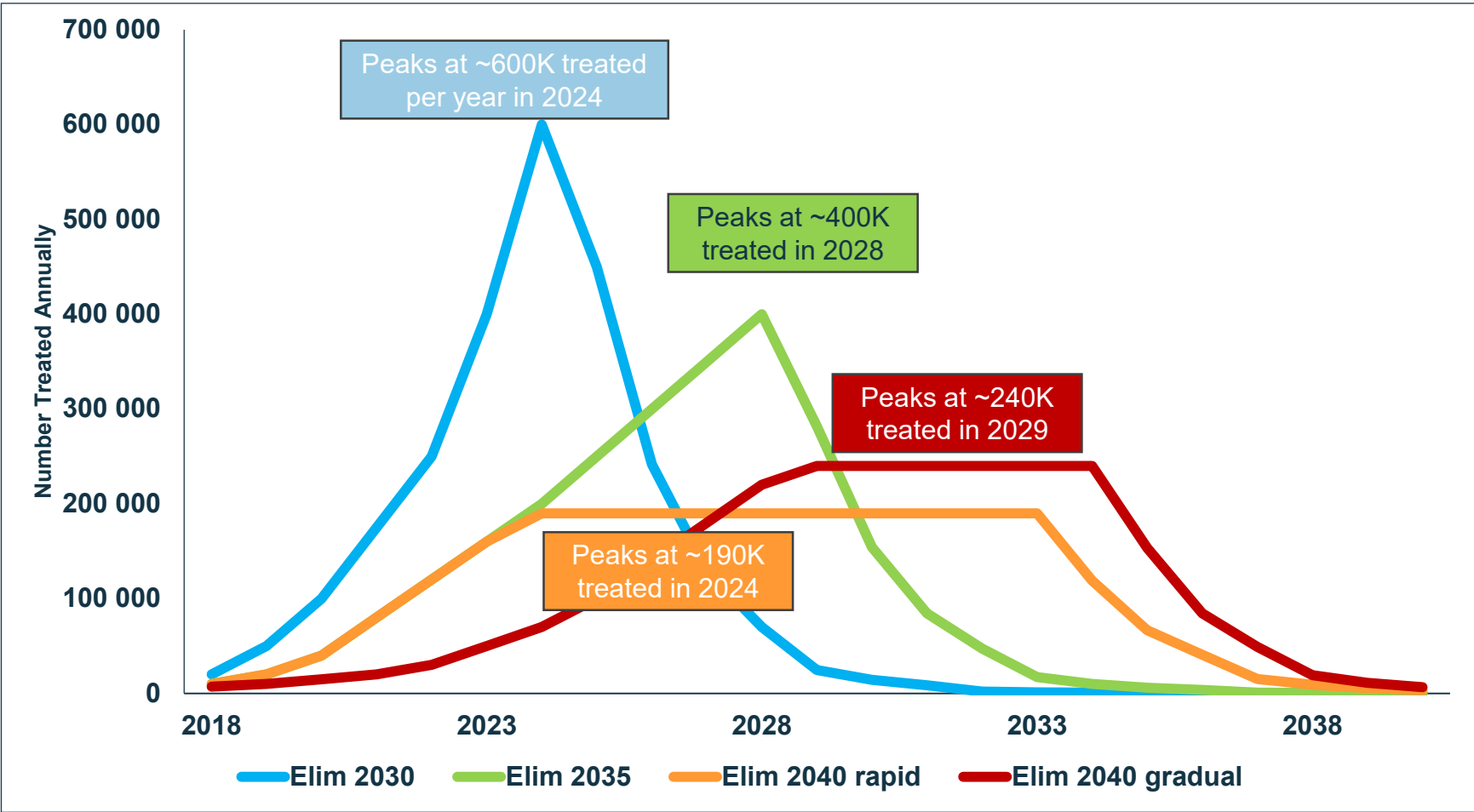
Through our investment case study, we present the epidemiological modelling and costing to support the development of a five year plan

The elements of the investment case include:

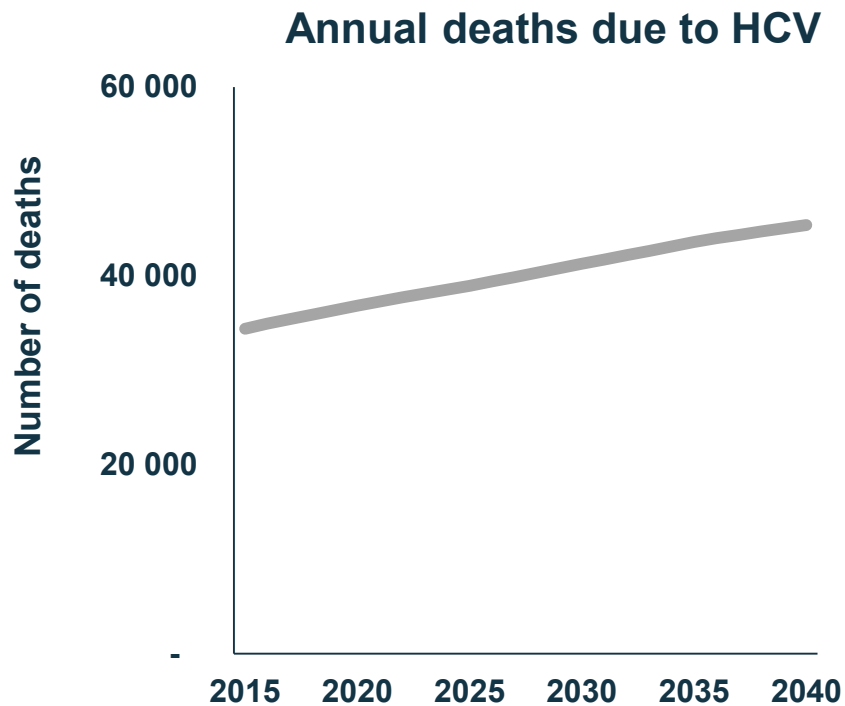
1. Designing feasible scale-up scenarios	We developed four elimination scenarios that represent possible ways to reach elimination at differing paces. We also modelled the status quo
2. Epidemiological modelling	We modelled the impact of each scenario on projected number of deaths, new infections, and cases of decompensated cirrhosis and liver cancer
3. Costing	We calculate both the short term (5 yr) and long term (to elimination) costs of a national hepatitis program
4. Cost-effectiveness analysis	We looked at the ratio of cost per death averted for each of the scenarios
5. Return on investment	We estimated the savings in healthcare costs for each of the scenarios compared to the status quo

Findings

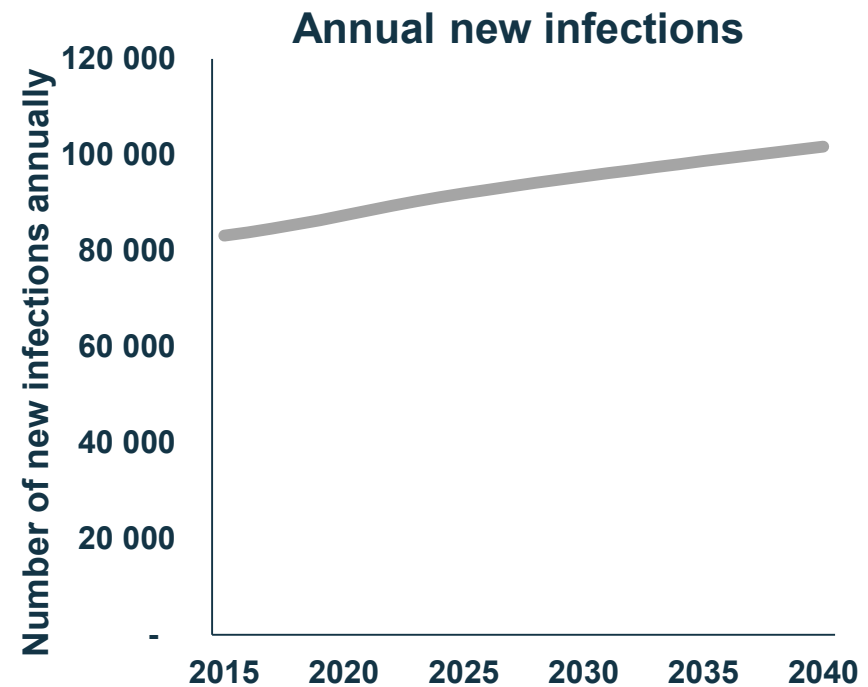
Elimination is possible either by a rapid scale-up to 2030 or by a gradual scale-up to 2040



Without launching a national elimination effort, 1 million deaths and 2.4 million new infections will occur by 2040

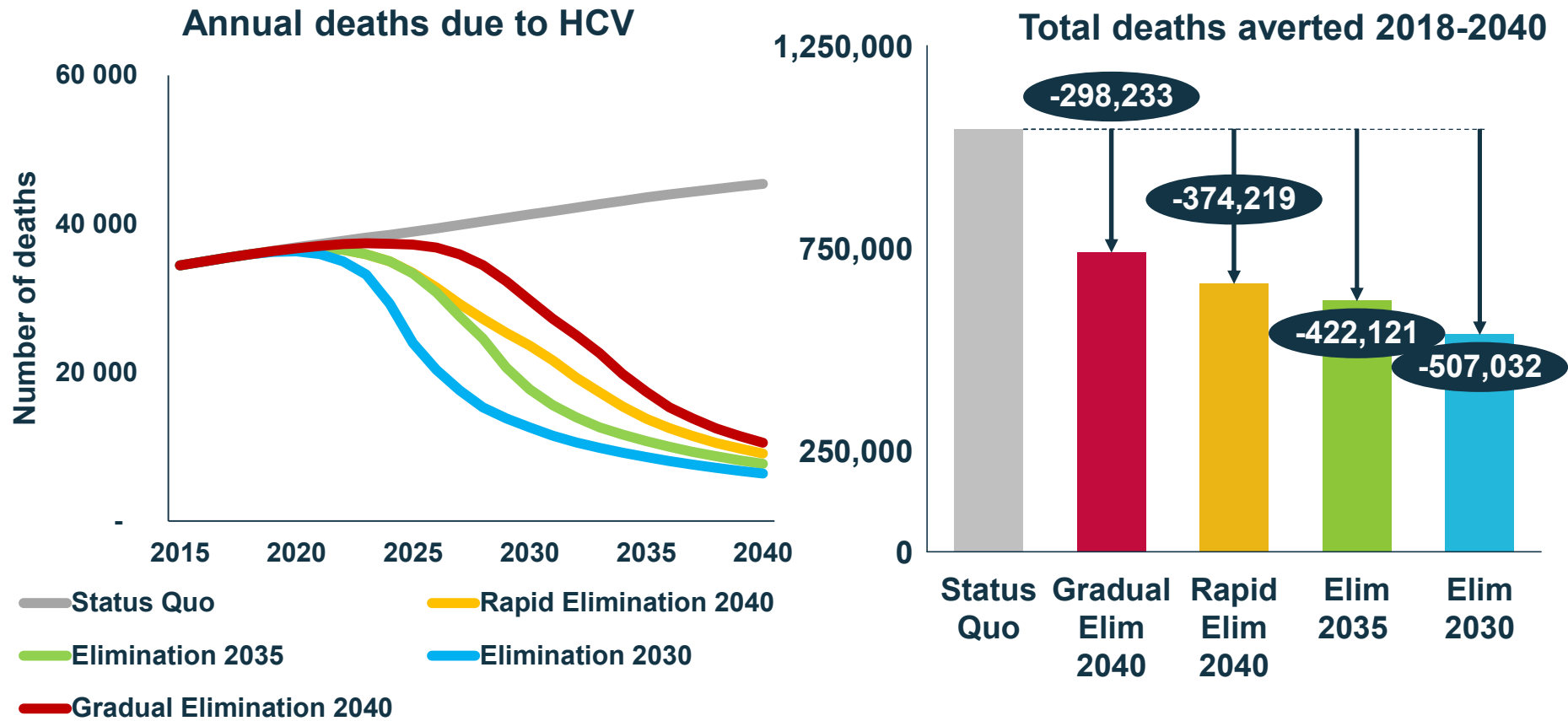


By 2040, there will be 45,000 deaths annually

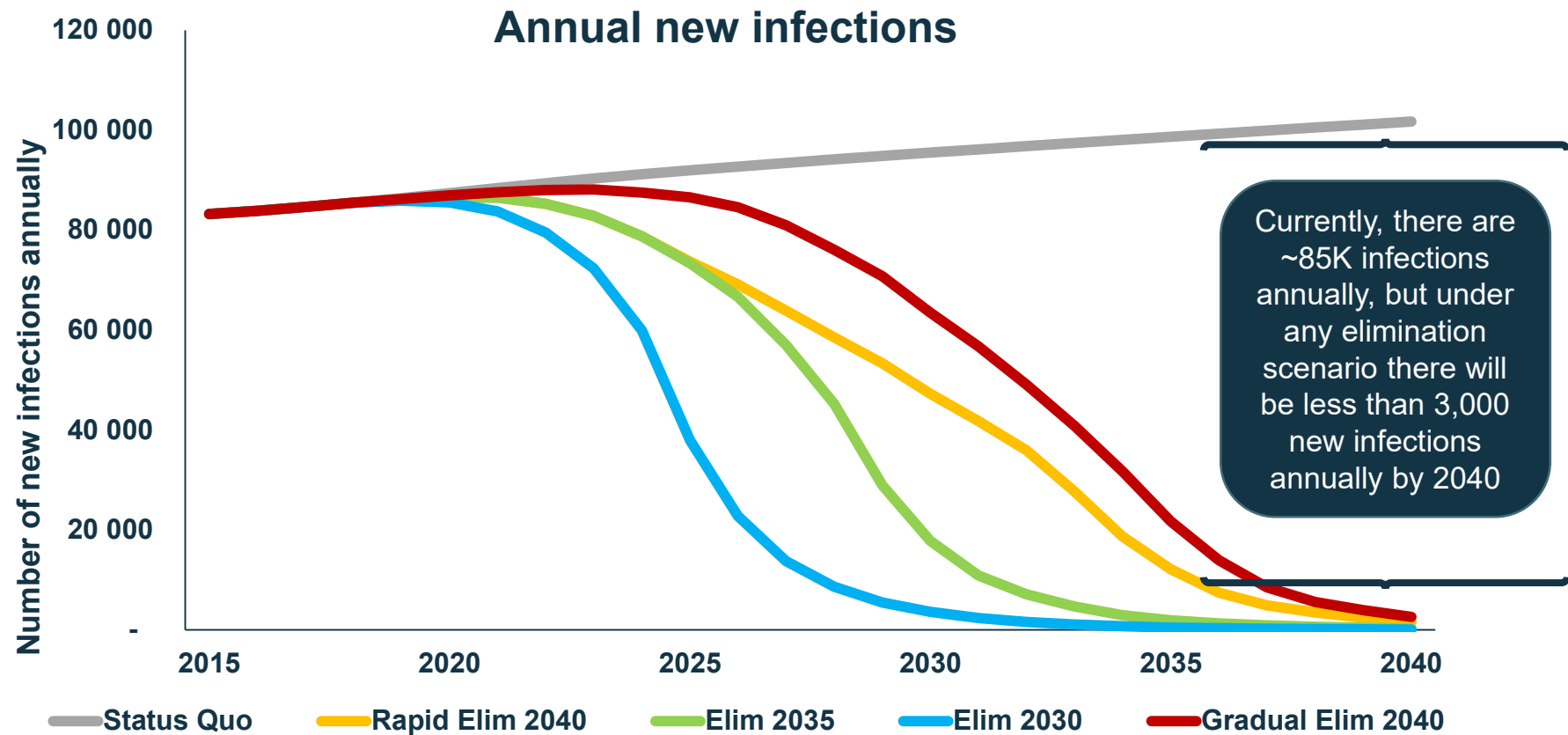


By 2040, there will be over 100,000 new infections annually

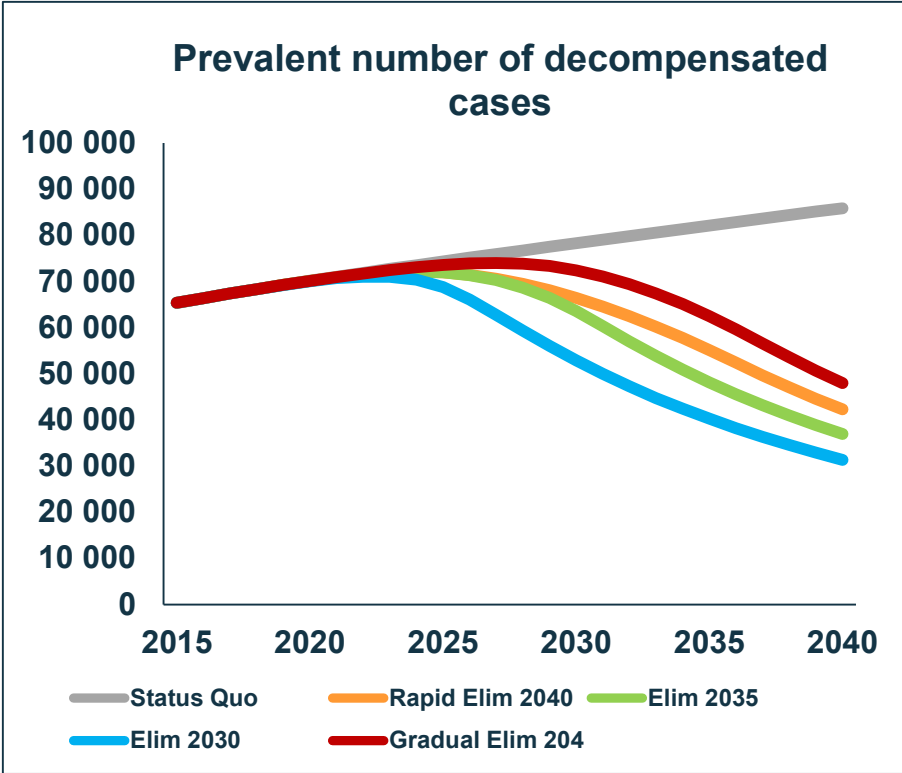
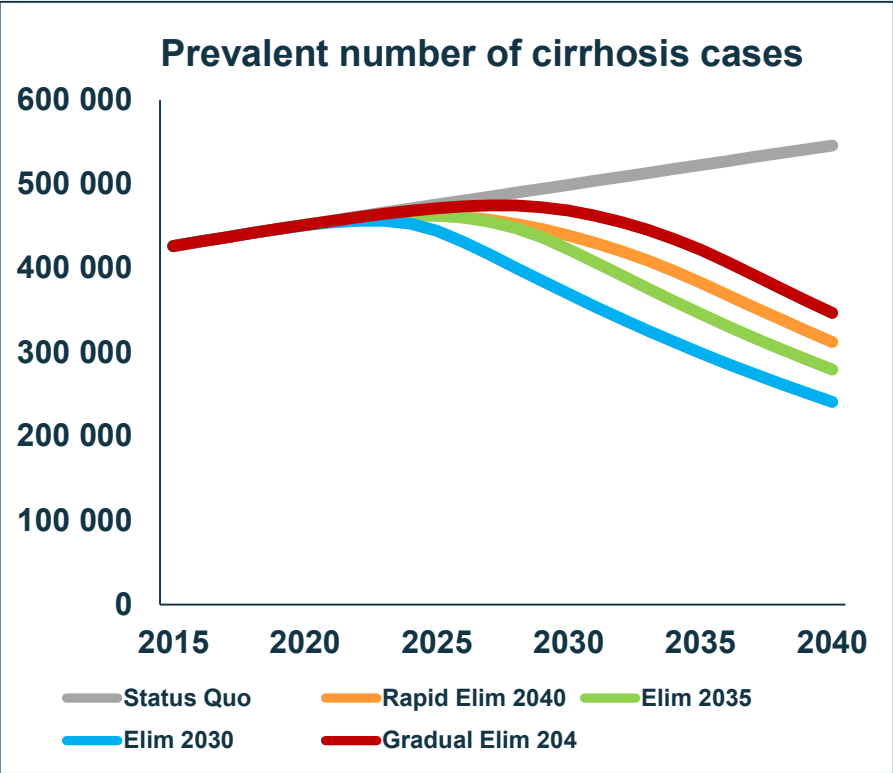
At least 300,000 deaths will be prevented by HCV elimination



HCV elimination will prevent at least 1 million deaths



By 2040, HCV treatment scale-up will reduce the number of advanced liver disease cases by 240,000



Prevent 200,000 cirrhosis cases per year by 2040 and at least 1.5 million total years of life lived with cirrhosis

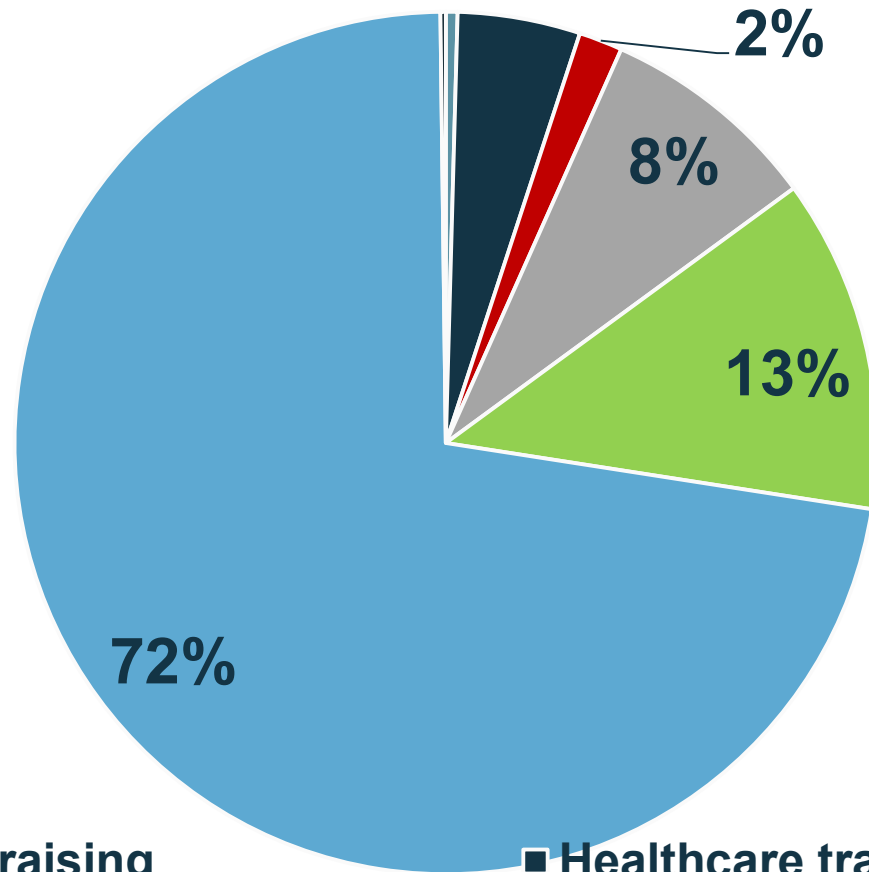
Prevent 40,000 decompensated cirrhosis cases per year by 2040 and at least 240,000 total years of life lived with decompensated cirrhosis.

The first five years of the elimination effort can cost as little as USD 290 M under the gradual elimination scenario

Priority Area	YR 1	YR 2	YR 3	YR 4	YR 5	Total costs
1. Awareness raising	0.22 M	0.22 M	0.23 M	0.20 M	0.20 M	1.1 M
2. Healthcare training	0.5 M	4.6 M	0.8 M	4.8 M	0.7 M	11.5 M
3. Prevention*						
4. Strategic information*	0.03 M	1.9 M	0.03 M	-	2.9 M	4.1 M
5. Lab strengthening*						
6. Screening	1.9 M	3.3 M	5.6 M	8.0 M	12.6 M	31.3 M
7. Diagnosis + Treatment	15.5 M	23.6 M	32.9 M	44.2 M	65.0 M	181.4 M
8. Monitoring & evaluation*	0.1 M	0.1 M	0.1 M	0.1 M	0.1 M	0.5 M
Total	18.3 M	33.7 M	39.7 M	57.3 M	81.5 M	230.0 M
Total + 25%	22.8 M	42.2 M	49.6 M	71.6 M	101.9 M	288.1 M

*For the 5-year costs, prevention and lab strengthening could not be costed and strategic information and M&E could only be partially costed due to limited information. As a result, we used a mark-up of 25% as a placeholder for these activity costs. This assumption was based on the distribution of costs in the Action Plans of other countries.

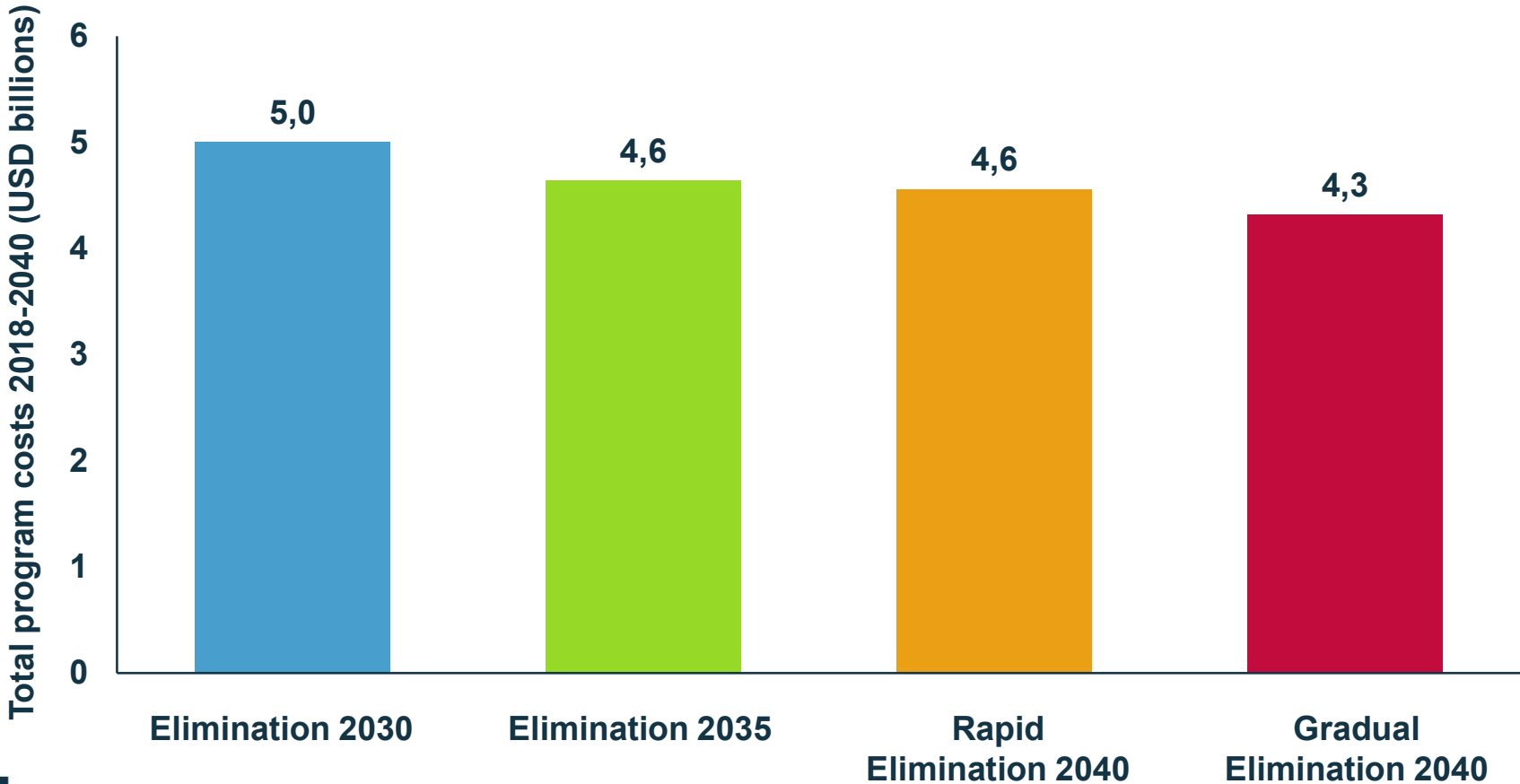
HCV diagnosis and treatment will represent 72% of five-year costs; screening will represent 13%



Thus, key cost inputs related to diagnosis and treatment, as shown earlier, should be pursued in the short-term as well

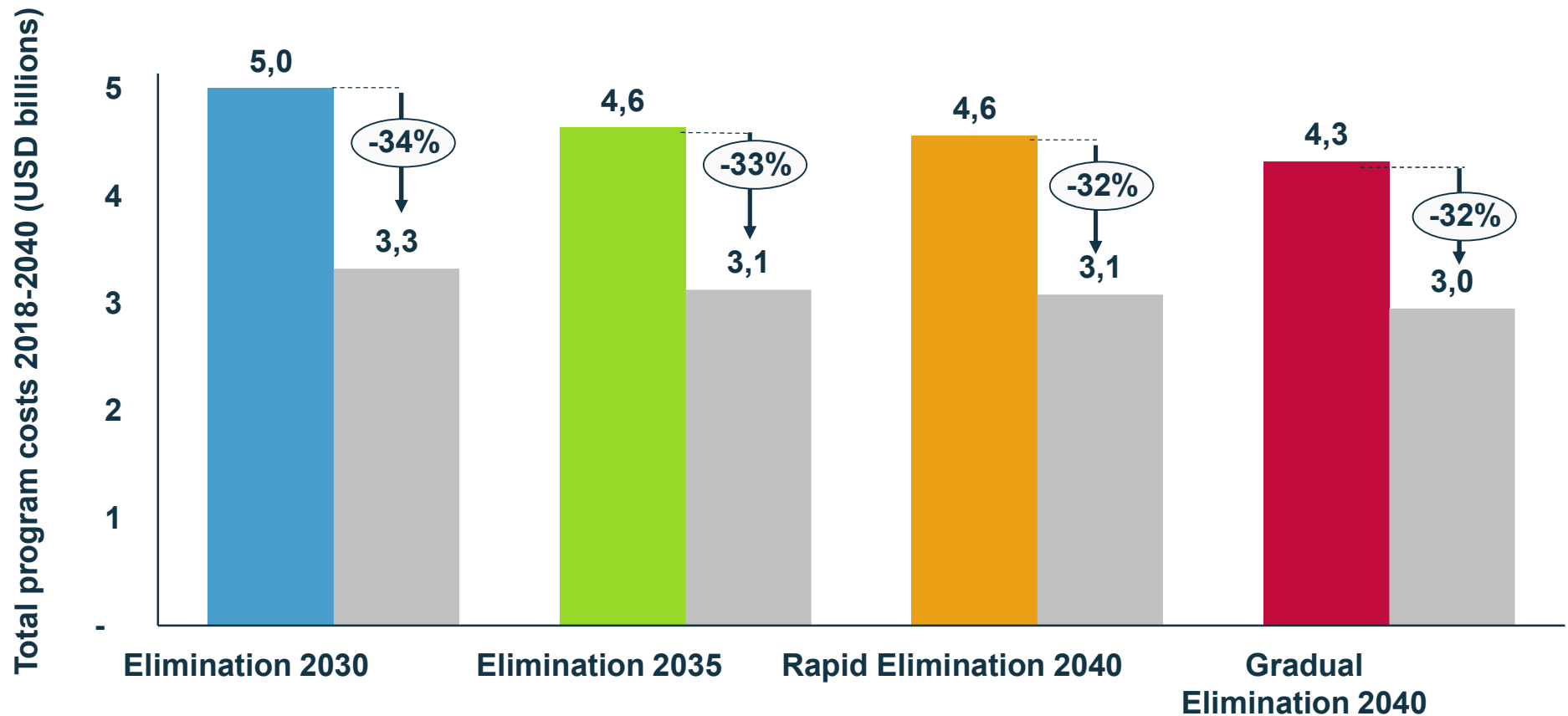
- Awareness raising
- Healthcare training
- Prevention
- Strategic information
- Other supporting activities
- Screening
- Diagnosis and treatment
- M&E

Total discounted costs of an elimination program (for 2018-2040) will be at least USD 4.3 B

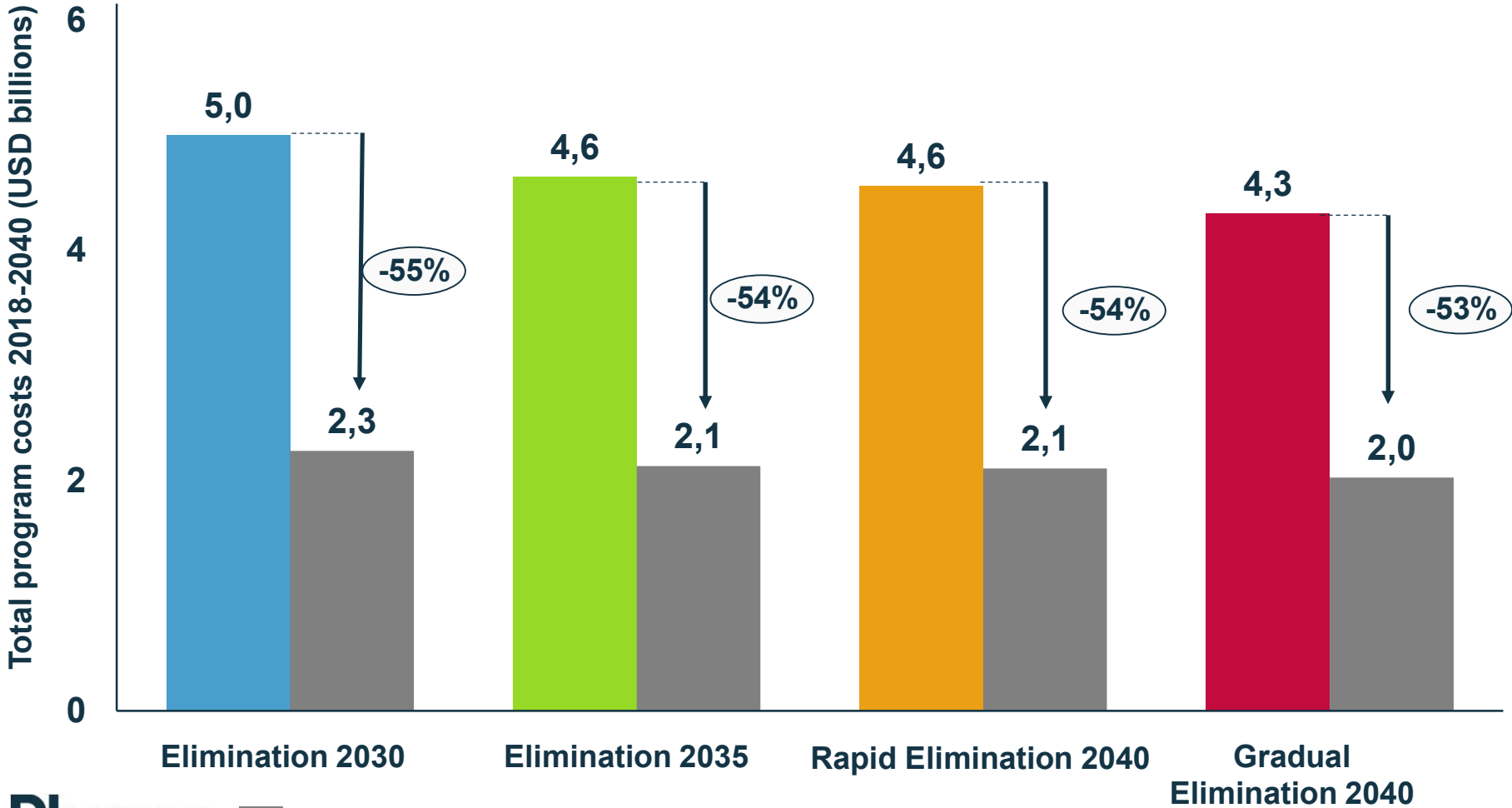


Price reduction 1

If a price of USD 600 per treatment course is secured before national scale-up begins, total program cost for 2018-2040 would be reduced ~30%

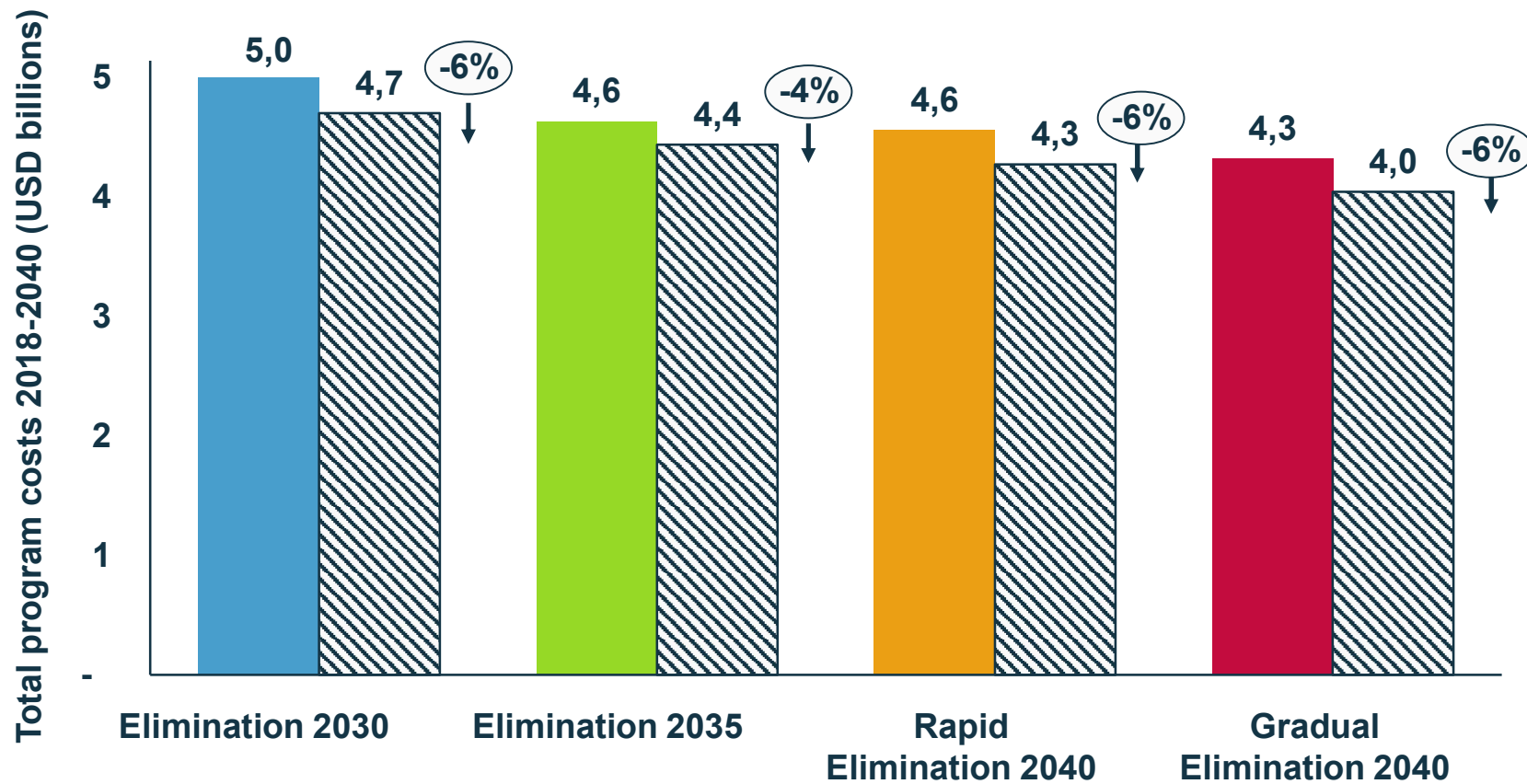


If this immediate price reduction is not secured, but DAA prices can be reduced to USD 150 over 5 yrs, then total program costs could be reduced by ~ 55%

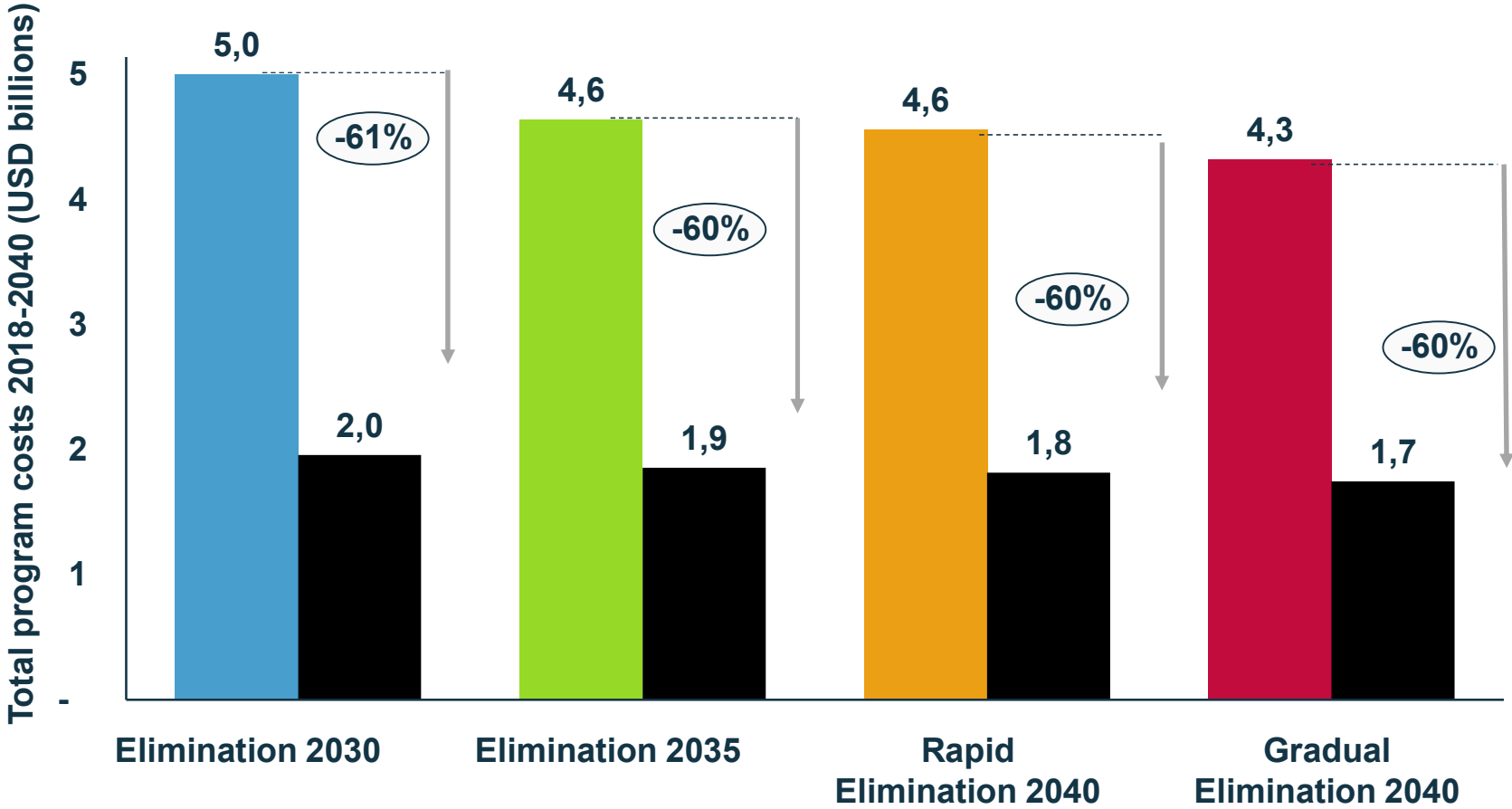


Price reduction 3

Total DAA program costs could be reduced by another ~5% if the price of a VL test is reduced to USD 40 over 5 yrs

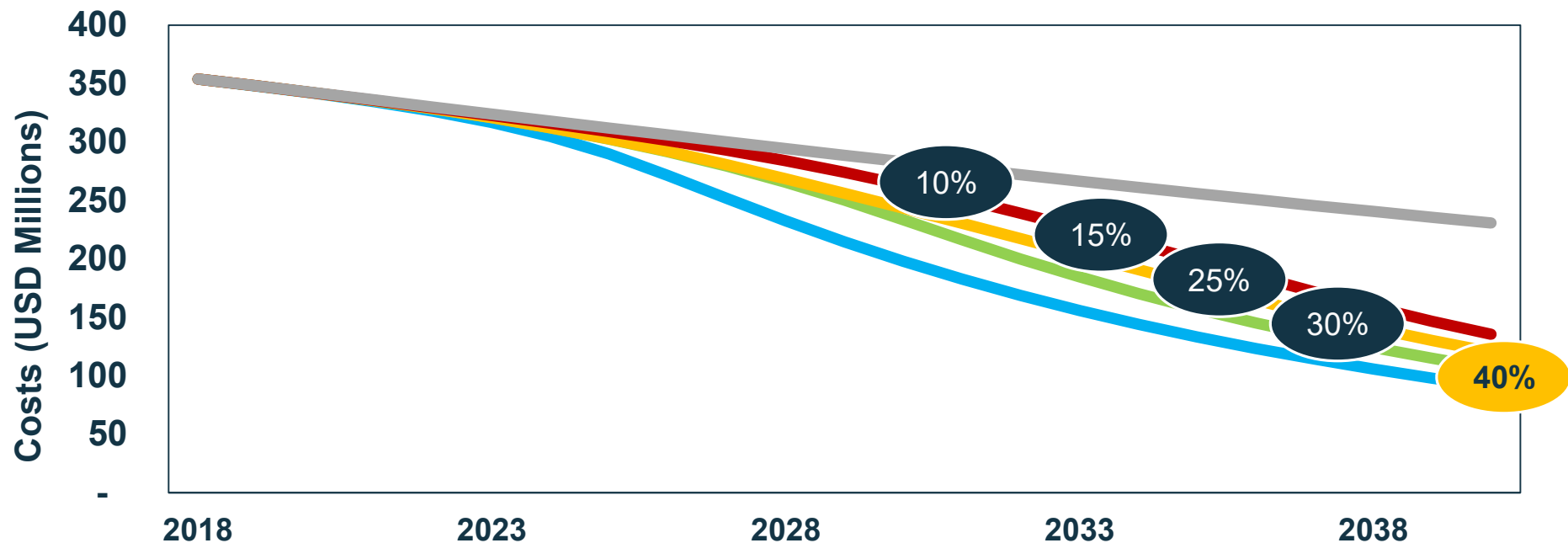


In total, program costs would drop by 60% if both the VL and DAA price reductions (to USD 150 per course) are secured...



DAA program scale-up will reduce annual costs of treating advanced liver disease by at least 40% by 2040

Cost of treating advanced liver disease over time 2018-2040

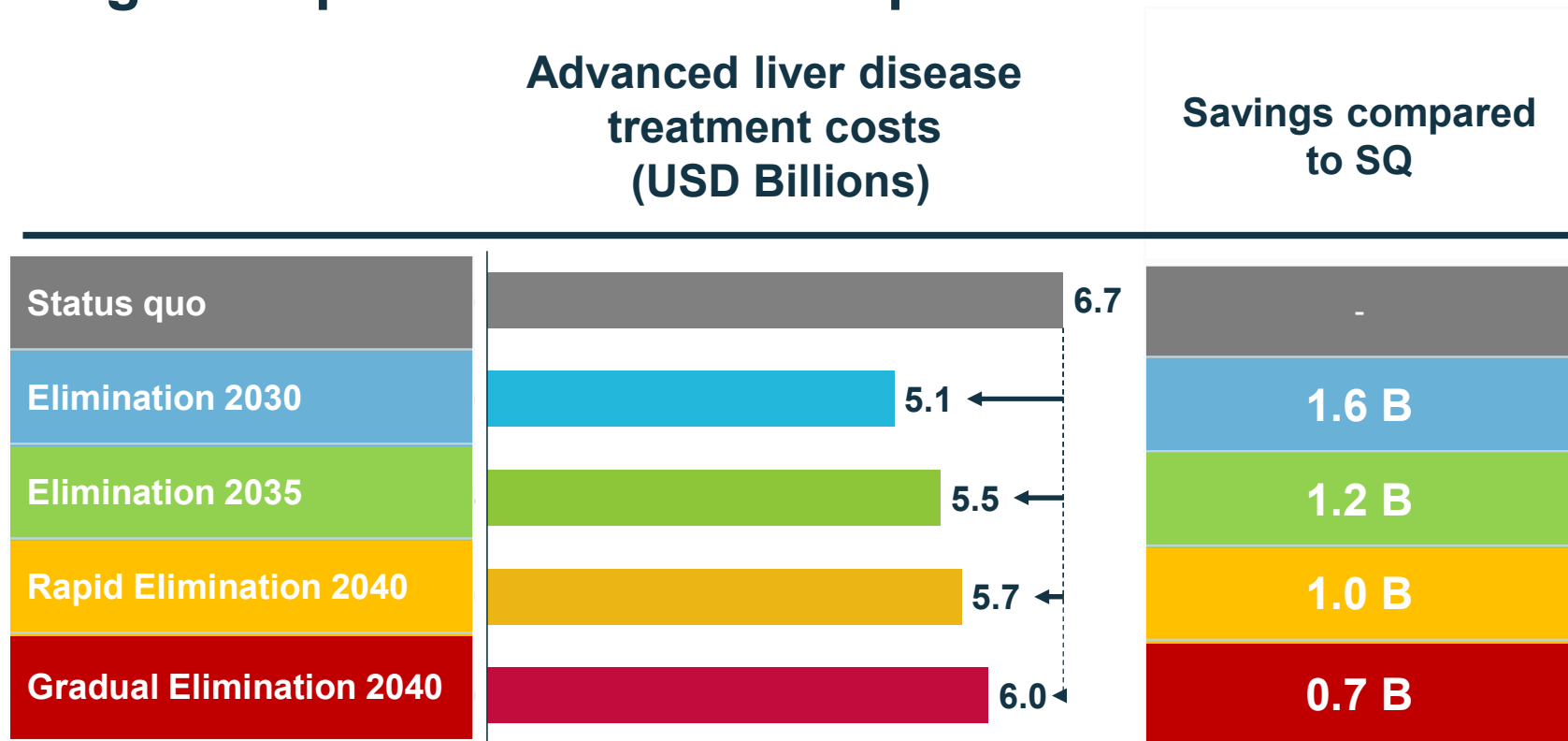


- Elimination 2030
- Rapid Elimination 2040
- Status quo

- Elimination 2035
- Gradual Elimination 2040

● % decline compared to status quo

This decline in advanced liver disease costs means that DAA scale-up will result in at least **USD 700 million** in savings compared to the status quo



All strategies would be cost-effective when compared to the status quo as well, including Gradual Elimination 2040 at 12,236 per death averted

Too much detail?

	Additional costs Compared to SQ (2018-2040)	Additional deaths averted Compared to SQ (2018-2040)	Cost-effectiveness ratio (Cost USD per death averted)
Status quo	USD 6.7 B	-	-
Elimination 2030	USD 3.4 B	507,032	6,772
Elimination 2035	USD 3.5 B	422,121	8,242
Rapid Elimination 2040	USD 3.6 B	374,219	9,627
Gradual Elimination 2040	USD 3.6 B	298,233	12,236

Under the Gradual 2040 scenario, an additional USD 3.6 billion spent compared to the status quo, over 13 years will result in an additional 300,000 lives saved

The cost-effectiveness of the Gradual Elimination strategy would improve with decreasing DAA prices at USD 600 per cure

	Additional costs Compared to SQ (2018-2040)	Additional deaths averted Compared to SQ (2018-2040)	Cost-effectiveness ratio (Cost USD per death averted)
Status quo	US 6.7 B		
Elimination 2030	USD 1.8 B	507,032	3,459
Elimination 2035	USD 2.0 B	422,121	4,674
Rapid Elimination 2040	USD 2.2 B	374,219	5,681
Gradual Elimination 2040	USD 2.3 B	298,233	7,647

Now under the Gradual 2040 scenario, only an additional USD 2.3 billion over 13 years would be required compared to the status quo to save over 300,000 lives

At USD 150 per cure, the cost-effectiveness of each scenario continues to become even more favorable compared to the status quo- at most USD 4,530 per death averted

	Additional costs Compared to SQ (2018-2040)	Additional deaths averted Compared to SQ (2018-2040)	Cost-effectiveness ratio (Cost USD per death averted)
Status quo	USD 6.7 B		
Elimination 2030	USD 0.69 B	507,032	1,353
Elimination 2035	USD 0.97 B	422,121	2,295
Rapid Elimination 2040	USD 1.14 B	374,219	3,059
Gradual Elimination 2040	USD 1.35 B	298,233	4,530

At such low DAA prices, under the Gradual 2040 scenario only an additional USD 1.4 B would be required to save 300,000 lives

Overall key findings

Coverage	<ul style="list-style-type: none"> Achieving elimination by 2030 or 2035 would require massive commitment to treat over 1 million patients in the next 5 yrs Elimination by 2040 would still require 2.6 M to be treated in the next 22 years but would allow a more gradual resource mobilization and capacity building effort
Epi Impact	<ul style="list-style-type: none"> Elimination by 2040 could avert ~1 million new infections and 300,000 deaths, in addition to significantly reducing the burden of advanced liver disease
Costs	<ul style="list-style-type: none"> But overall DAA scale-up will require intensive resources at ~USD 4 B from 2018-2040 at baseline assumptions The first five year costs are more manageable at USD \$290 M The Gradual 2040 scenario would avert at least 700 M in healthcare costs The most expensive parts of the scale-up program will be diagnosis and treatment DAA price reductions could reduce total costs by >60%
Cost-effectiveness	<ul style="list-style-type: none"> The Gradual 2040 scenario would cost at most an additional \$3.6 B (without DAA price reductions) compared to the status quo and would save 300K more lives The cost-effectiveness of DAA scale-up seems comparable to other interventions in Indonesia and HCV analyses in other countries
PWID	<ul style="list-style-type: none"> Screening and treating PWID as part of the elimination strategy will prevent 250,000 additional infections and save as much USD 500 M in program

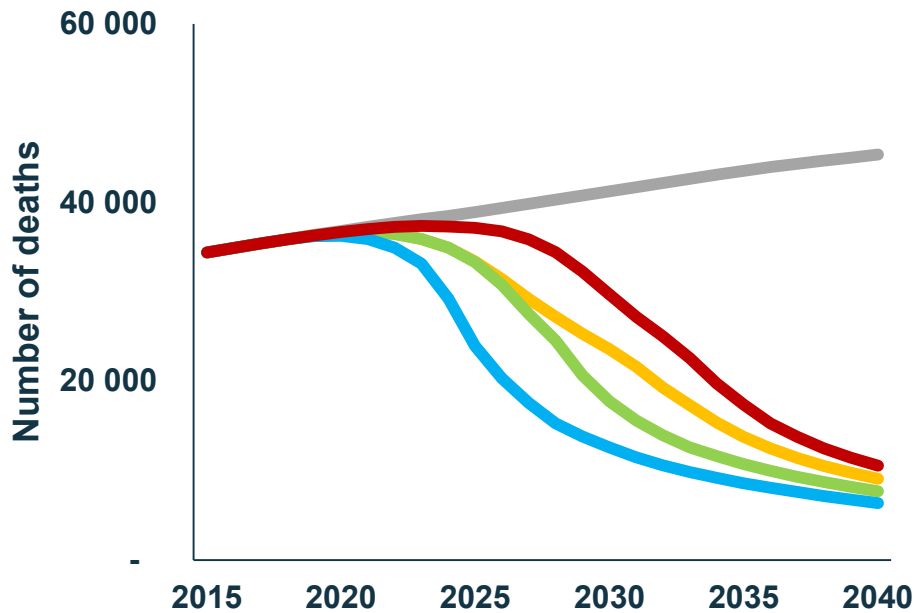
Screening and treatment of PWID are a critical part of the overall investment case

- **Context:** The prevalence of HCV in PWID is ~90%
- **Impact:** If PWID were targeted for treatment in the early years of the Gradual Elimination 2040 scenario, almost **100,000 additional deaths could be prevented and an additional 250,000 new infections averted**
- **Cost:** Targeting PWID also increases the efficiency of screening and treatment efforts, meaning fewer people have to be screened and treated over time, **saving more than USD 600 M in total program costs**
 - Targeting PWID during screening saves USD 20 M since fewer people have to be screened to find one treatment initiator
 - Targeting PWID with treatment would save at least USD 500 M (at baseline DAA prices) since 500,000 fewer people have to be treated
- The cost-effectiveness of a Gradual Elimination 2040 PWID targeted scenario at baseline DAA prices would be USD 7,523 per death averted compared to 12,236 per death averted without targeting

Conclusions

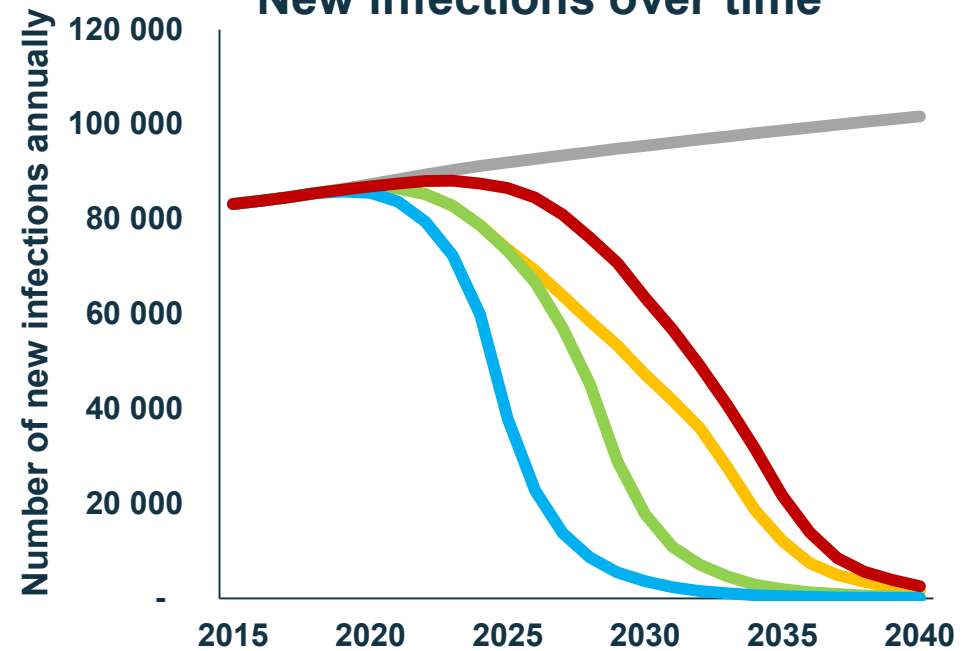
HCV elimination will result in more than 300K lives saved, at least 1 M infections averted, and prevention more than 1.5 M cases of cirrhosis and HCC

Deaths due to HCV over time



- Status Quo
- Gradual Elimination 2040
- Elimination 2035
- Rapid Elimination 2040
- Elimination 2030

New infections over time



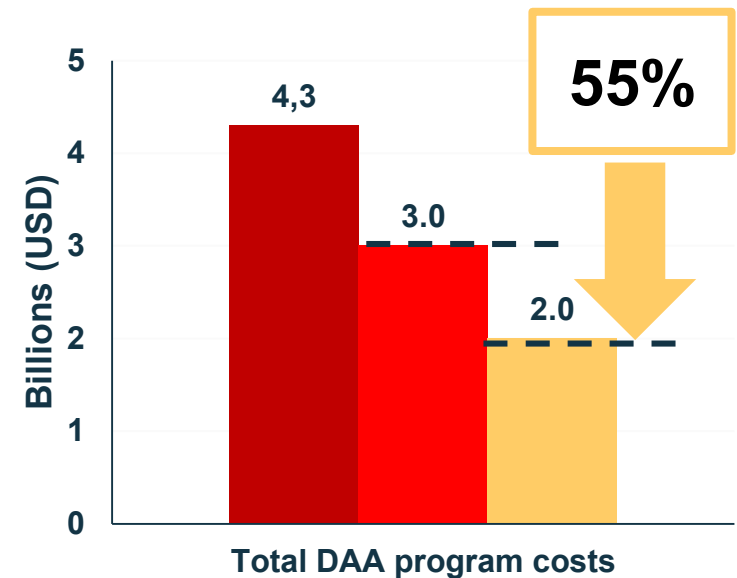
- Status Quo
- Gradual Elim 2040
- Elim 2035
- Rapid Elim 2040
- Elim 2030

Gradual 2040 represents an operationally and financially feasible elimination strategy that must be pursued to put Indonesia on the path to elimination

- Gradual 2040 will only require treating 30K patients in year 5 compared to 250K in year 5 under Elimination 2030. In the peak year of the elimination program, 240K will be treated under Gradual 2040, in comparison to 600K under Elimination 2030.
- Over the next 5 years, Gradual 2040 will cost USD 290 M, assuming no price reductions in DAAs or VL. This will allow a soft start to scale-up at only 1/8th of total elimination costs, allowing time for full resource mobilization. These 5-year costs could be even lower than USD 290 M if immediate DAA price reductions are obtained.
- The scenario analysis demonstrated that the benefits of elimination will be maximized if patients are treated earlier on. The earlier patients are treated, the more lives that can be saved and complications prevented. We did not model a scale-up strategy more gradual than Gradual Elimination 2040, but it can be assumed the public health benefits will continue to diminish the longer scale-up is delayed.
- If no action is taken at all, 1 million deaths and 2 million new infections will occur.

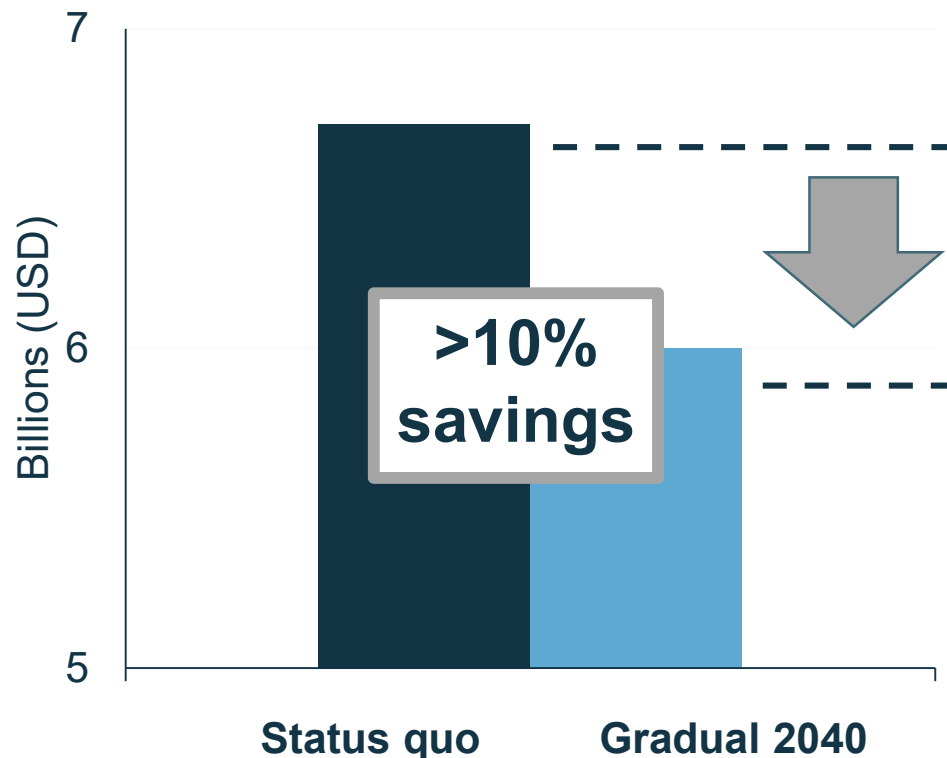
Total elimination costs will be significant, as much as USD 4 B, but securing lower prices, particularly for DAAs, will help reduce these costs by >55%

For Gradual 2040 Elimination	Status quo	DAA USD 1314	DAA USD 600	DAA USD 150
DAA program costs	-	4.3 B	3.0 B	2.0 B
Costs of treating advanced liver disease	6.7 B	6.0 B	6.0 B	6.0 B
Cost-effectiveness ratio (USD per death averted compared to SQ)	---	12,236	7,647	4,350



■ DAA price @ USD 1314 ■ DAA price @ USD 600
 ■ DAA price @ USD 150

By investing in DAA cures, Indonesia can also save ~USD 1 B in averted costs of treating chronic sequelae of HCV



- DAA program investments would save over 700 M in advanced liver disease costs for cirrhosis, decompensated cirrhosis, and HCC (from USD 6.7 B in the SQ to USD 6 B under Gradual 2040)
- These savings contribute to the high cost-effectiveness of the DAA program due to offsetting the program costs
- Even at conservative prices, an additional USD 3.3 B will result in 300,000 lives saved. At lower DAA prices, these 300,000 lives could be saved for only USD 1 B.