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Modelling the Social Impact of alirocumab in patients with severe hypercholesterolemia treated with apheresis in Germany

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Background

- Patients with severe hypercholesterolemia are at high risk of cardiovascular events [1].
- In some patients, the necessary LDL-C lowering cannot be achieved by intensive lipid lowering therapy alone. In Germany, such patients are treated with apheresis, an time consuming and costly procedure.
- In the ODYSSEY ESCAPE trial alirocumab (PCSK-9 inhibitor) was superior to placebo at reducing the frequency for apheresis therapy [2].

Objectives

- To quantify the potential social health benefit of using alirocumab in the German severe hypercholesterolemia population from 2017 to 2022.

Methods and data

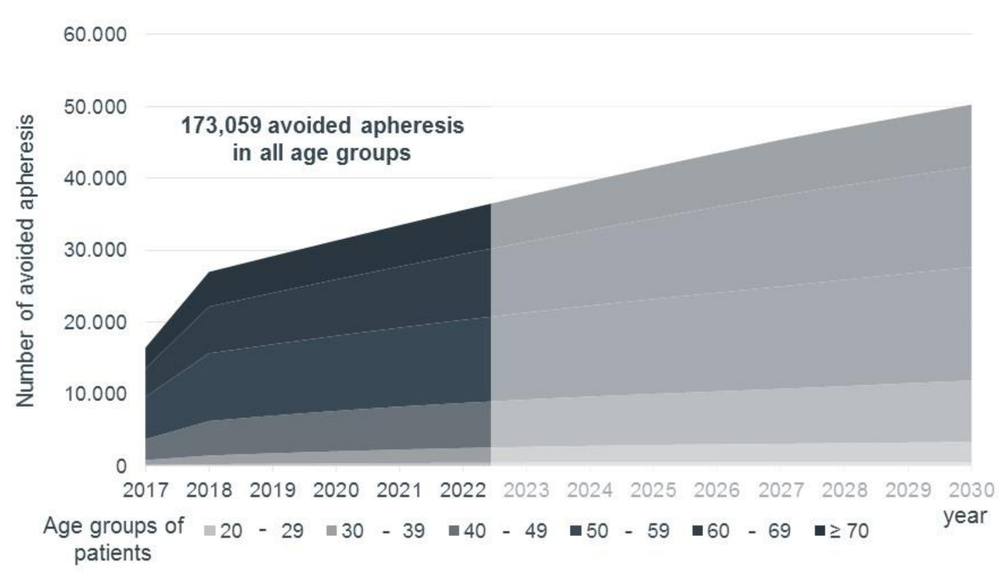
- We used the results of ODYSSEY ESCAPE and created a markov simulation model to estimate the number of apheresis treatments which can be avoided over the course of 6 years.
- By creating an open cohort population model we estimated the population wide reductions and linked them to productivity through the average amount of time (6 hours) patients spend on one apheresis treatment.
- German employment data and Time Use Surveys were used to allocate the total amount of gained time to paid and unpaid work activities.
- Paid work was valued according to average wages, unpaid work according to the proxy good approach.
- In addition, we looked at indirect and induced economic effects, resulting from additional productivity.
- Furthermore, we estimated the cost effects of the use of alirocumab in German apheresis patients using current prices and costs of one average apheresis treatment to the amount of 1,011 € [3].

Results

Number of avoided apheresis

- In a small population of 600-900 patients [4], **173,059 apheresis treatments** can be avoided due to the use of alirocumab within six years.

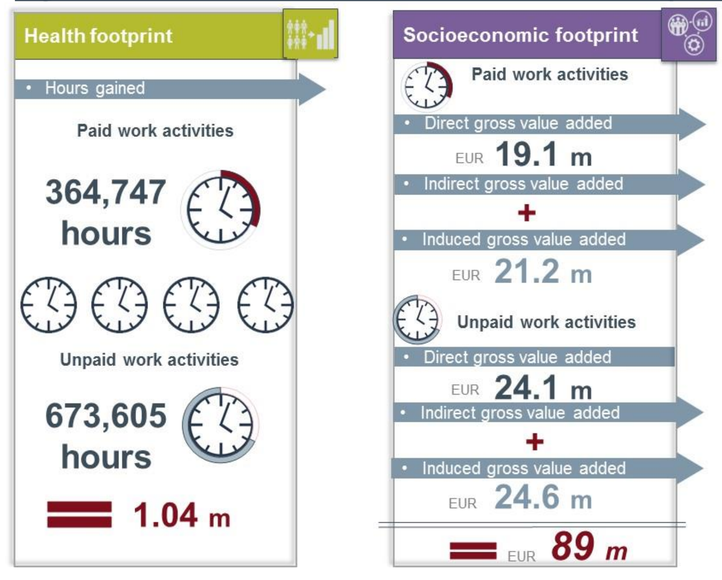
Figure 1: Avoided apheresis until 2022



Gained active time and Gross Value Added (GVA)

- The 173,059 avoided apheresis yield **1.04 million active hours** in terms of paid and unpaid work activities in the German severe hypercholesterolemia population [5,6].
- These gained activities comes along with **€ 89 million of GVA** in the German economy.

Figure 2: Gained active time and Gross Value Added (GVA)



Cost effects for the statutory health insurance (SHI)

- As apheresis treatment is a very expensive therapy, the avoidance of apheresis can not only yield in additional GVA for the German economy, but also in cost effects for the SHI.
- Therefore we also modelled the cost effects comparing a scenario with alirocumab and the standard of care and included the costs for the apheresis treatment, adverse events of apheresis that require hospitalisation and the costs for alirocumab.
- Over the course of 6 years, the avoidance of apheresis treatments in the German severe hypercholesterolemia population can lead **to € 150 m cost savings for the SHI**.

Conclusion

- This study shows that replacing costly and time consuming apheresis treatments with alirocumab to lower LDL-C levels in patients with severe hypercholesterolemia leads to significant societal productivity gains and cost savings for the SHI.

References

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