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# EXECUTIVE SUMMARY OF “THE VALUE OF CLINICAL TRIALS IN DENMARK”



Authors:

Christian Jervelund, Søren Brenøe & Andreas Ross Kirk

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Pharmaceutical companies rely on their ability to develop new medicine for patients. Part of the development process involves conducting clinical trials, which provide insights into the safety of the medicine, and its effects and side effects on human patients. The results of these trials are also critical towards determining whether the medicine can be granted a marketing authorisation. Clinical trials are thus extremely valuable to pharmaceutical companies.

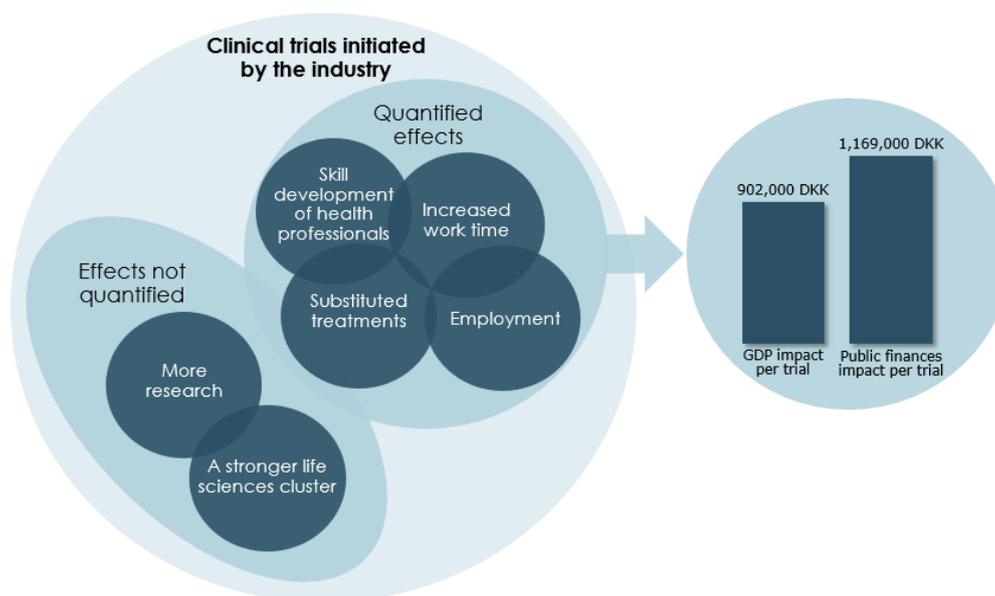
Our analysis finds that clinical trials generate a considerable return to the specific country in which they are conducted. This return is in excess of the value generated by future revenue for the pharmaceutical company. For every 1 krone spent by private companies on clinical trials in Denmark, a 64 øre increase in GDP is generated. This return reflects that, despite globalisation, the geographical placement of trials is vital towards the dispersion and application of new knowledge. In 2015, the pharmaceutical industry initiated 175 clinical trials in Denmark. We find that these trials generated value to the Danish society via two separate channels.

## **A healthier Denmark**

First, clinical trials contribute to enabling a healthier Denmark. We show that, in 2015 in conjunction with clinical trials, pharmaceutical companies spent 248 million kroner improving the quality and capacity of the

public health sector, to the benefit of all patients. In practice, this expenditure occurred by paying for the time of doctors and nurses, as well as by sponsoring medicine and medical equipment employed at hospitals. This boost to the public sector, in combination with the private sector activity generated by the trials, meant that each clinical trial initiated by the industry improved Danish GDP by an average of 902,000 kroner. Each clinical trial also boosted public finances by an average of 1,169,000 kroner. See Figure 1 below.

Doctors spend more time at work when they partake in clinical trials. Their participation also provide them with new skills and qualifications. These effects can mean that they are subsequently better equipped to treat ‘normal’ patients. Our analysis shows that 38% of doctors agree that their participation in clinical trials initiated by the industry has improved their clinical skills. We also find that there is a high dispersion of the new knowledge generated by clinical trials. 61% of doctors and nurses believe that the new skills and knowledge that they have acquired from the trials have also positively impacted other doctors and nurses in their ward. By comparison, the positive knowledge spillover effects on foreign hospitals are considerably smaller. This reflects the importance of geographical proximity for knowledge dispersion. Being closer to the source of new knowledge substantially increases the probability of

**Figure 1 The effects of clinical trials initiated by the industry in Denmark**

Note: The gains per trial imply that the 175 clinical trials initiated by the industry in 2015 improve Danish GDP by 158 million kroner and public finances by 205 million kroner.

Source: Copenhagen Economics

knowledge transfer. The same conclusion holds for the knowledge generated by new research, which is spurred by clinical trials.

### A boost to employment

Clinical trials initiated by the industry in Denmark enable approximately 387 additional full-time employees (FTE) in the public health sector, whose wages are paid for by the pharmaceutical companies. The 387 positions consist of approximately 300 nurses, 56 doctors and 31 other positions, such as laboratory technicians. On top of the public sector employment effect, clinical trials also engage around 548 private sector employees, which means that the total employment effect is approximately 935 full-time jobs. This does not necessarily imply a corresponding increase in labour supply – something which has been accounted for in our calculations of the impact on GDP and public finances.

An increase in the number of clinical trials initiated by the industry could lead to the creation of even more jobs

in Denmark. This can be assessed by considering that the *average* clinical trial initiated by the industry generates 5.3 FTEs, consisting of 3.1 FTEs in the private sector and 2.2 FTEs in the public sector. The total employment effect can also be assessed relative to the size of the investment: For every 1 million kroner pharmaceutical companies invest in clinical trials, 1.3 FTEs are generated, consisting of 0.5 FTEs in the public sector and 0.8 FTEs in the private sector.

### The promotion of high quality research

Second, clinical trials positively impact research, which increases overall productivity, and makes Denmark a more desirable place to work and run a life sciences business.

Our analysis finds that clinical trials initiated by the industry often lay the foundations for new research. We find that 35% of trials generate follow-on research within the same therapeutic area. Whether this research

simply substitutes other research that would have occurred instead is difficult to determine. However, it can certainly be argued that such follow-on research is of a higher quality, and is more likely to generate a high return, since it builds on existing results from clinical trials within the same therapeutic field. The degree to which the existence of local research contributes to overall welfare in Denmark is unclear, but economic studies find a very high long-run return to research.

A high level of research activity in Denmark is one of the prime parameters towards attracting researchers, as well as attracting further research investment from foreign pharmaceutical companies. By making Denmark more attractive when it comes to research and development activities, clinical trials initiated by the industry contribute towards strengthening the cluster of the life sciences industry in Denmark.

### Implications

It is important to distinguish between global and local gains from clinical trials and research. If medicine is developed in Sweden or Germany instead of Denmark, the benefits of that medicine will still become available to Danish patients, should it prove beneficial to health outcomes. However, in this report, we show that there are also productivity effects, knowledge spill-overs and qualitative effects, which cannot to the same extent be obtained in places other than where the trials themselves are conducted. When clinical trials are conducted in Denmark, these effects thus mainly benefit Denmark.

Pharmaceutical companies may be more or less indifferent regarding whether clinical trials are conducted in Denmark or elsewhere. They are likely to simply conduct the trials wherever it is most profitable and cost-effective. For this reason, it is crucial to understand which factors can make companies choose to run clinical trials in Denmark instead of other countries, and to act on these insights in order to attract more trials.

We find that hospitals are the prime beneficiaries of many of the positive effects, including the effects on public finances. We also find that the trust which is built between individual doctors/hospitals and pharmaceutical companies can be a key reason for why companies choose to run their next trial with the same doctors/hospitals. Our study finds that 39% of doctors have run several clinical trials in collaboration with the same com-

pany within the last three years. These points collectively highlight that doctors and hospitals are simultaneously some of the greatest beneficiaries of clinical trials, as well as a key factor towards attracting further trials.

### Selected results from surveys

The analyses in the report are based on surveys answered by health professionals and pharmaceutical companies. On the following pages, we present three central figures based on the findings of these surveys. The figures are numerated figure 3-5 in correspondence with the report.

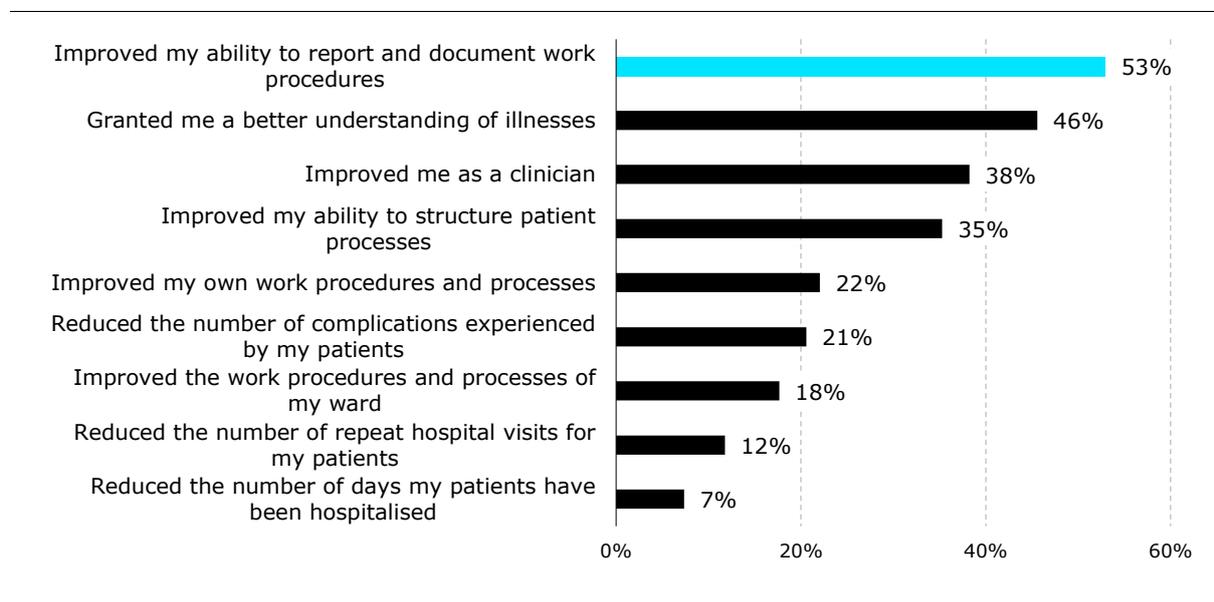
#### About this executive summary

This is the executive summary of the report on the value of clinical trials in Denmark. The original report title in Danish is *Værdien af kliniske forsøg i Danmark*.

The report and this translation by Copenhagen Economics is commissioned by NEXT Partnership ([nextpartnership.dk](http://nextpartnership.dk)), The Danish Association of Pharmaceutical Industry ([Lif.dk](http://Lif.dk)) and Invest in Denmark ([investindk.com](http://investindk.com)), which is part of the Ministry of Foreign Affairs of Denmark.

The full report in Danish is available at [copenhageneconomics.com](http://copenhageneconomics.com).

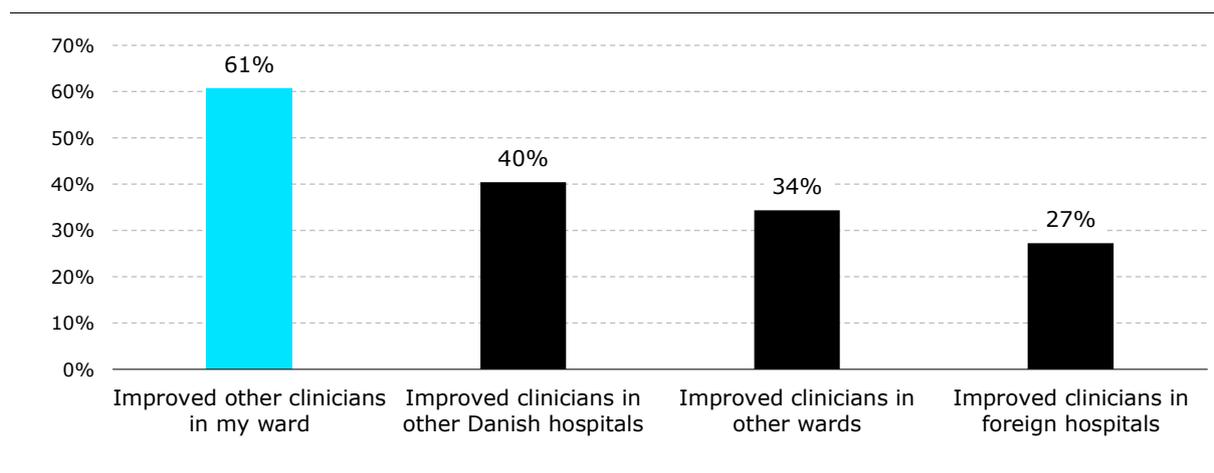
**Figure 3 Doctors' and nurses' skill development from participation in clinical trials**



Note: n=99. The percentages refer to the number of doctors and nurses, who have declared themselves to “strongly agree” or “agree” with the following statement “My participation in clinical trials initiated by the industry has...”.

Source: Copenhagen Economics

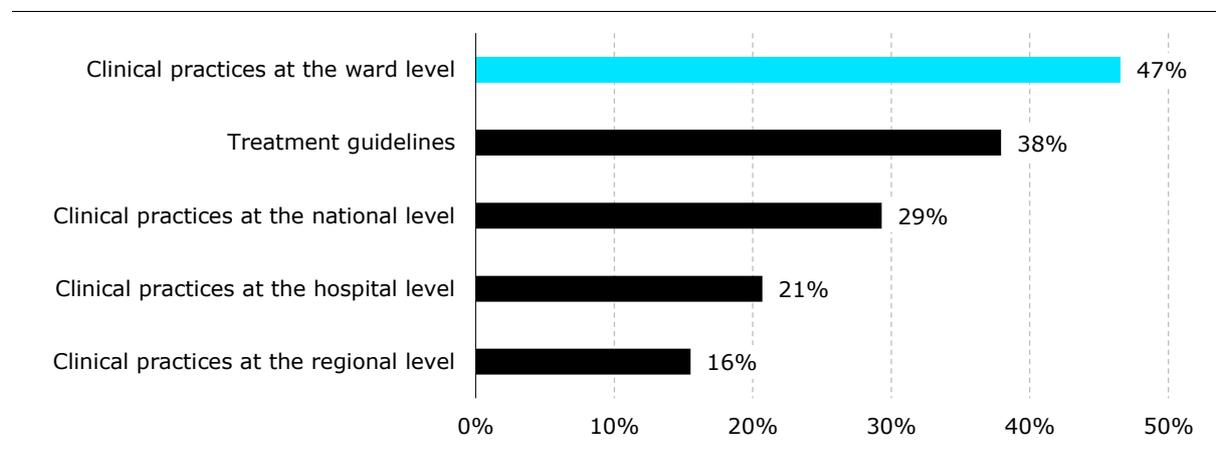
**Figure 4 Dispersion of new knowledge from clinical trials**



Note: n=99. The percentages refer to the number of doctors and nurses, who have declared themselves to “strongly agree” or “agree” with the following statement “My participation in clinical trials initiated by the industry has, via the dispersion of my knowledge...”.

Source: Copenhagen Economics

**Figure 5 Changes in clinical practices due to clinical trials**



*Note: n=63. The percentages refer to the number of doctors, who have ticked boxes relating to one or more of the statements above in response to the question “Has your participation in clinical trials initiated by the industry led to a change in...”.  
Source: Copenhagen Economics*

### About Copenhagen Economics

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