# Is asking enough?
# The long-term benefits of (mental) health screening in high school

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**Abstract**

While many children suffer from mental health issues, less than half of them receive treatment. To increase treatment uptake, the Dutch government introduced (mental) health screening in high schools. While results from a pilot study show large increases in treatment uptake, causal estimates exploiting the staggered roll-out of the intervention show that screening does not significantly impact healthcare utilisation. In line with these null effects on healthcare utilisation, there are no significant improvements in long-term educational and labor market outcomes either.

**Keywords**: Mental health, Education, Labor supply, Disability Insurance

**JEL**: I18, I24, J08, J22

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# 1 Introduction

One in two individuals will suffer from mental health issues at some point in their lifetime and the majority of those mental health issues emerge during childhood (OECD, 2014; Jones, 2013). These childhood mental health issues negatively affect educational outcomes (Currie et al., 2010) and they are associated with a range of worse long-term outcomes such as employment status, marital status and criminal behavior (Goodman et al., 2011; Anderson et al., 2015; Cornaglia et al., 2015).

Treatment for mental health issues can in some instances be effective in mitigating these negative effects Chorniy & Kitashima (2016); Dalsgaard et al. (2014). However, despite the promising effects of mental healthcare, only about half of all children suffering from mental health issues receive treatment (Merikangas et al., 2010; Olfson et al., 2015). Increased uptake of treatment could therefore yield significant benefits.

In this paper, I investigate one potential way to increase take-up of treatment, namely (mental) health screening in high school. Health screening for 16/17-year-old students in high school was introduced in the Netherlands in 2012 in response to reports of increased mental health issues among youth. Given that the median age of onset of mental health issues is approximately 14.5, the intervention thus aims at early detection of untreated (mental) health issues among a population with a relatively high risk of recently having developed these issues (Solmi et al., 2022). The intervention comprised a one-hour in-class session in which students completed a questionnaire about their health. If the questionnaire points to potential health issues, students receive a one-on-one consult and are referred onward to specialized care if needed. Section 2 discusses the intervention in detail.

In the first step of the paper, I examine whether such a screening intervention causally increases treatment uptake. The second step of the paper examines whether potential increased treatment uptake positively affects long-term educational and labor market outcomes. By exploiting the staggered roll-out of the screening moment throughout the Netherlands, I find that the screening moment does not significantly impact the utilisation of care. Heterogeneity analysis shows that these null results hold for various subpopulations. In line with the absence of an impact on healthcare utilisation, there is

no evidence of positive impacts on educational or labor market outcomes measured at the age of 21 or 24. High school exit exam grades, the total completed years of education, the probability of being employed, the corresponding earnings, and the probability of receiving various social benefits are unaffected by the screening moment.

These results contradict the conclusions of a pilot study conducted in 2011 before the national implementation of the screening intervention (Wisse et al., 2014). This pilot study indicated that 10% of all students were referred to specialised care after the screening moment. One potential explanation between the pilot's and this paper's conclusions lies in the methodology. The pilot study only followed treatment cohorts over time while this paper controls for the evolution of healthcare utilisation of control cohorts. In the absence of the screening moment, a significant share of the students in the pilot study might have sought care through other channels offsetting the impacts found in the pilot study. This highlights the need for ex-post causal estimation of policy reforms.

Similar to the intervention being studied in this paper, previous papers have examined the effects of mental healthcare offered within schools: care offered through school-based mental health services (SBMHs) and care offered through school counsellors. Golberstein et al. (2023) find that the introduction of SBMHs increases mental healthcare treatment use but does not affect educational outcomes. The second form of mental healthcare being offered within a school is through school counsellors. An increase in the number of school counsellors does lead to reduced reports of problematic behaviour and in some cases, also increases educational outcomes (Reback, 2010a,b). These counsellors can provide some form of mental care, but their role is broader, implying that their positive impact could arise through various channels.

More broadly, previous literature has found mixed results on the impact of treating mental health problems. Chorniy & Kitashima (2016) and Dalsgaard et al. (2014) find that ADHD medication reduces risky behaviour and hospital use among youth. Currie et al. (2014) on the other hand find no effects of ADHD medication on academic outcomes. For depression, the use of pediatric antidepressants has also been found to improve academic outcomes (Busch et al., 2014). Similarly, access to youth mental health services

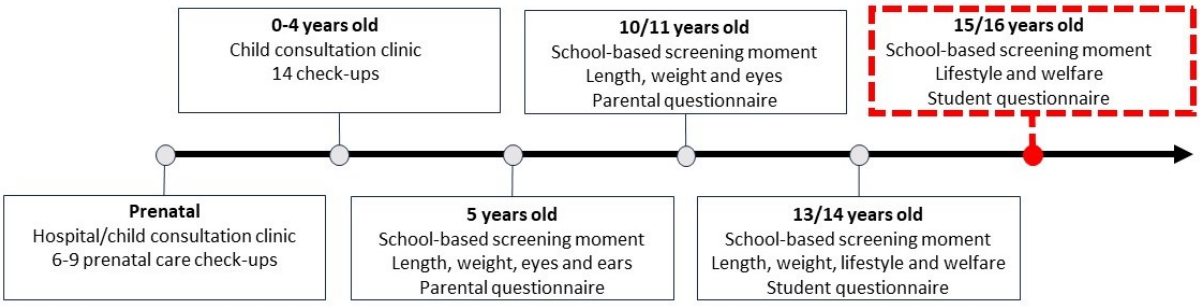
reduces crime and improves educational outcomes (Cuellar & Dave, 2016; Deza et al., 2022; Jácome, 2020; Heller et al., 2017).

The remainder of this paper is organized as follows: A description of healthcare during childhood in the Netherlands and the exact intervention is given in Section 2 followed by a discussion of the data in Section 3. Sections 4.1 and 4.2 discuss the impact of the screening moment on healthcare utilisation and other outcomes respectively. Section 4.3 examines differential impacts of the reforms on various subpopulations and finally Section 5 concludes.

# 2 Healthcare during childhood in the Netherlands

The setting of this paper is the Netherlands, where there are several scheduled healthcare moments throughout childhood. Figure 1 gives an overview of these healthcare moments.[1] During low-risk pregnancies, there are 6 to 9 check-ups at either child consultation clinics or at hospitals. Once a child is born, the child consultation clinic becomes the main provider of care, and children receive approximately 14 check-ups between the moment of birth and their fourth birthday. Once a child turns four and enters lower school, check-ups at the consultation clinic end and youth healthcare providers take over. These youth healthcare providers (30 in total) each have their own geographic catchment area.[2] The providers have some flexibility in the services they offer, but the general setup of services

Figure 1: Overview of standard healthcare moments during childhood in the Netherlands




[1]The overview shows the care being provided to a child without any health issues. The provision of care can be scaled up if deemed necessary.

[2]See Appendix Figure A.1 for a map of the Netherlands showing the geographic catchment area of each youth healthcare provider.

is as follows.

Prior to 2012, youth healthcare providers offered three health screening moments in lower and high school. The first screening moment takes place when children are approximately 5 years old. During this screening moment, a nurse goes to the school and checks the length and weight of all children and administers an eye and ears test. Additionally, parents fill in a questionnaire about the health of their child. If either the checks performed by the nurse or the questionnaire filled in by the parents indicate any health issues, the nurse or a paediatrician follows up and invites the parents and child for a consultation. If necessary, the child is referred onward to a specialised (health)care provider after the consultation. The second school-based screening moment takes place when the child is 10 or 11 years old. This second screening moment is very similar in setup to the first screening moment, the only exception being that the hearing of children is not checked.

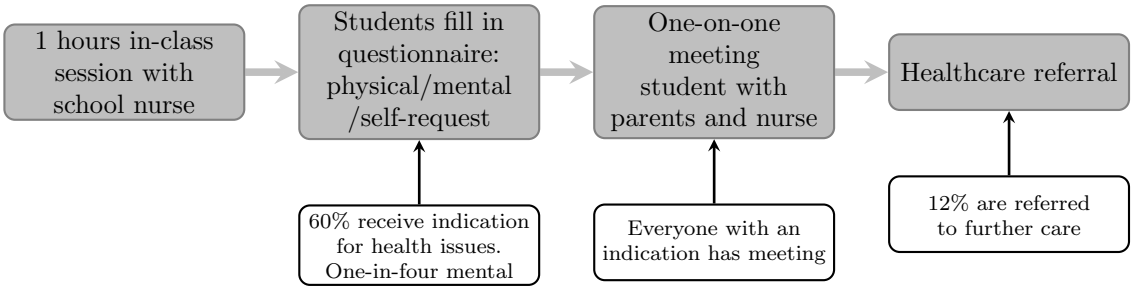
The third screening moment in school takes place in the second grade of high school when children are usually 13 or 14 years old (similar to grade 8 in the US). Parental involvement decreases as now instead of the parents filling in a questionnaire, the children fill in a questionnaire about their own health. Additionally, a nurse again measures length and height and discusses general lifestyle and welfare aspects with the child. If any healthcare issues become evident, the parents and the child are invited for a consultation. If deemed necessary, the child is again referred to specialised care after the consultation. Prior to 2012, this screening moment was the final scheduled moment of contact between youth healthcare services and the child.

## 2.1 The reform: Additional health screening in high school

From the mid-2000s onward, various interest groups called for additional health screening of adolescents.[3] As a result, the National Institute for Health and Environment ordered an investigation to be done concerning the desirability and potential set-up of an additional screening moment for children aged between 13 and 18. The resulting policy rapport published in 2008 indicated that such a screening moment was indeed desirable and

[3]Among these interest groups were the Medical Association of Paediatricians and the Association of Dutch Municipalities.

Figure 2: Setup of screening moment in high school and 2011 pilot results




should take place in the fourth grade of high school (similar to grade 10 in the US) when children are aged 15 or 16 years old (TNO, 2008). According to the policy rapport, the screening moment should mainly focus on lifestyle and welfare aspects with a strong focus on unhealthy/risky behavior and mental health with the goal of detecting health(care) issues among students who had no prior indications of issues. In 2009, the National Institute for Health and Environment advised the government to implement the screening moment as recommended in the original policy rapport (RIVM, 2009).

The government followed the recommendations and implemented a pilot study in five high schools led by the youth healthcare provider of the city of Amsterdam in the 2011/2012 academic year. Figure 2 illustrates the setup of the screening moment and the findings of the pilot study. Similar to the earlier healthcare moments, the screening moment consists of a one-hour in-class session with a school nurse. The nurse discusses various aspects of health and healthcare, after which students fill in a questionnaire. This questionnaire contains roughly three parts related to health(care): (1) physical health, (2) mental health, (3) self-request. A selection of the questions from this questionnaire is shown in Table 1.

If the questions on physical health or mental health indicate potential health issues or if the student indicates a self-request, the student and his parents are invited to a one-on-one meeting with the nurse. The pilot showed that approximately 60% of the students had (elevated risk of) health issues and were referred to a nurse (Wisse et al., 2014; Wisse, 2014). One in four of these students received an indication because of mental health-related issues. After the one-on-one meeting with the nurse, students can be referred onwards to specialised care if necessary. In the pilot study, 12% of all screened

Table 1: Selection of questions in questionnaire

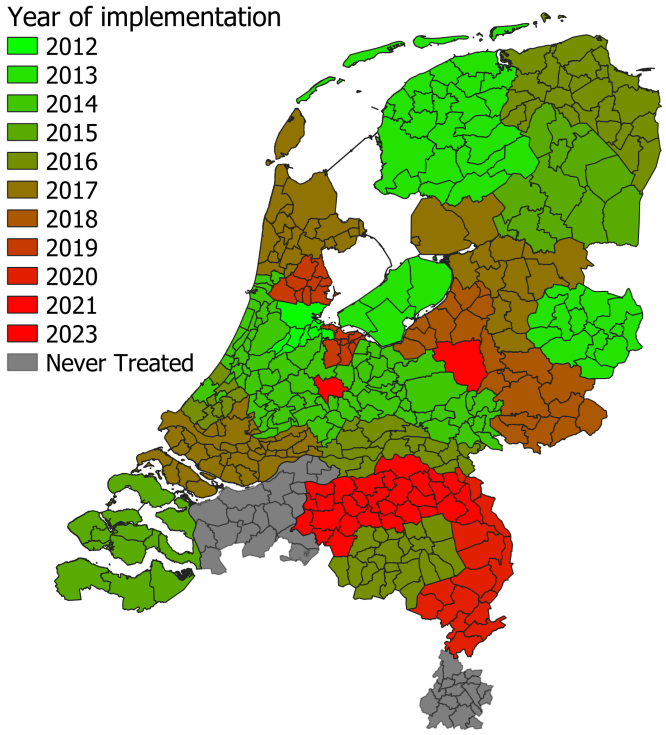
| **Mental health** |
|---|
| Have you had any of the following conditions? ... |
| I am restless |
| I get very angry |
| I worry a lot |
| I often feel sad |
| I am easily distracted and have a hard time focusing |
| I get nervous in new situations. I easily lose my confidence |
| I am afraid of many things. I get fearful quickly. |
| In the last 12 months, have you considered ending your life? |
| Have you been mentally abused in the past? |
| Have you had unwanted sexual experiences in the past? |
| Have you recently lost a loved one? |
| ... |
| **Physical health** |
| Have you had any of the following conditions? ... |
| How many days a week do you eat breakfast? |
| How many days a week do you eat fruit? |
| How many days a week do you eat vegetables? |
| How many days a week do you walk or bike to school? |
| How many days a week do you exercise? |
| How many days a week do you watch TV and for how long? |
| How many days a week do you use your laptop/phone/gaming console and for how long? |
| (How often) do you smoke? |
| (How often) do you drink alcohol? |
| (How often) do you use drugs? |
| ... |
| **Self-request** |
| Do you have other questions or concerns you would like to discuss with the nurse in private? |

Note: The full questionnaire consists of more than 100 questions, and different questionnaires are used by different youth mental healthcare providers. All questions are multiple-choice with answer possibilities being false/somewhat true/true or alternative Likert-scale options

high school students were referred to specialised care.

Following the pilot, funding was made available to the youth mental healthcare providers to implement the screening moment nationally from 2012 onward. The actual implementation of the screening moment was however optional, which led to a staggered adoption across youth healthcare providers. Figure 3 shows how the adoption evolved over time, with the first providers starting in 2012 and 2 providers still not administering the screening moment in 2024. It is important to note that the timing of the implementation does not correlate with any regional characteristics. Discussions with the youth mental health providers indicate that the year of implementation largely depended on the availability and effort of a singular member of staff setting the intervention up.

Figure 3: Overview of the roll-out of the screening intervention across the Netherlands




# 3 Data

Several administrative datasets covering the entire Dutch population provided by Statistics Netherlands are combined to obtain a complete picture of healthcare utilisation and a range of outcomes for all Dutch high school students. These individual-level data are complemented with data collected on the roll-out of the intervention.

## 3.1 Sample of interest

The national educational register is used to construct the sample of interest: cohorts of treated and untreated students. The register contains information on the grade and level of education every student is in, in every academic year. Table 2 shows the number of students in each cohort year and the fraction of that cohort living in a treated municipality. The educational data also contains the results of the high school exit exams and the highest followed and completed level of education in 2023. These measures will be used as educational outcome variables in the analysis.[4]

[4]The educational data additionally contains information on the field of study and grade retention. These measures will be used as additional outcomes in the future.

Table 2: Cohort sizes and fraction in treated municipalities

| Cohort year year | Cohort size[a] | Percentage living in treated municipality |
|---|---|---|
| 2009-2011 | 158.161 | 0.0% |
| 2010-2011 | 156.850 | 0.0% |
| 2011-2012 | 153.478 | 1.1% |
| 2012-2013 | 159.591 | 10.8% |
| 2013-2014 | 160.193 | 16.8% |
| 2014-2015 | 163.669 | 33.6% |
| 2015-2016 | 166.152 | 42.9% |
| 2016-2017 | 166.502 | 57.7% |
| 2017-2018 | 164.761 | 72.0% |
| 2018-2019 | 164.085 | 74.6% |
| 2019-2020 | 155.783 | 77.4% |

(a) Number of students in grade 4 in a given academic year

Background characteristics of the students are obtained through the municipal administration database and the tax registers. The municipal administration database allows linkage between students and their parents and it contains information on the age, gender, nationality and municipality of residence. These background characteristics are obtained for the student and both parents. Parental characteristics are complemented with information on annual income from the tax register.

## 3.2 Data on healthcare utilisation

Information on healthcare utilisation is obtained through the health insurance system. The data set contains yearly expenditures covered by basic health insurance for the years 2009 through 2020. Given the mandatory nature and broad coverage of basic health insurance in the Netherlands, it encompasses the majority of all health utilisation. Expenditures are reported in distinct categories. These categories are grouped into mental healthcare, non-mental healthcare and pharmaceuticals.[5] It should be noted that from 2015 onward, data on mental healthcare expenditures is only available for individuals aged 18 and above. For later cohorts in the sample, there is thus a gap in the mental healthcare data from 2015 until the year they turn 18.

[5]See Appendix Table A.1 for the classification of expenditure categories into mental healthcare, non-mental healthcare and pharmaceuticals.

The annual healthcare spending data is complemented with more detailed data on pharmaceutical utilisation for mental health-related diagnosis. In particular, data on the utilisation of the following 7 ATC-4 code pharmaceuticals is included: (1) antidepressant, (2) antipsychotics, (3) anxiolytics, (4) hypnotics, (5) psychostimulants/adhd, (6) drugs for addictive disorders, and (7) opioids. Unlike the healthcare spending data, this dataset covers all individuals (children and adults) throughout the entire sample period (2006-2022).

## 3.3 Data on criminal behavior

STILL TO ADD: data on criminal charges and convictions

## 3.4 Data on labor market outcomes

Lastly, data on labor market outcomes will be used as additional long-term outcomes. These outcomes are obtained through the tax registry and contain the monthly employment status, wage earnings and labor earnings. Additionally, the monthly panel data contains indicators for the receipt of various social benefits such as unemployment benefits, sickness/disability benefits and other social benefits. These data are available for the years 2009 to 2022. This makes it possible to follow students for up to 10 years after the screening moment for the first cohort screened in 2012.

## 3.5 Descriptive statistics

Table 3 shows descriptive statistics of the 2011-2012 cohort of students. This cohort is the last cohort consisting of only untreated students given that the earliest implementation of the screening moment was in the 2012-2013 academic year. Given that the intervention aimed to increase the uptake of treatment, and given the large differences in treatment uptake between various demographic groups, the table shows descriptive statistics for both the entire population of students and for the subpopulation of students receiving some form of mental health treatment in 2012. Differences in the composition between these two samples indicate differences in the uptake of treatment in various subpopulations.

Table 3: Descriptive statistics of the full 2011-2012 cohort and the subsample receiving some form of mental healthcare in 2012

| | Full 2011-2012 cohort | Subsample receiving mental healthcare[a] |
|---|---|---|
| **Annual healthcare utilisation[b]:** | | |
| Receiving mental healthcare | 9.2% | 100.0%** |
| Mental healthcare expenditures | 403.90 | 4,373.41** |
| Receiving pharmaceuticals | 17.8% | 21.8%** |
| Physical healthcare expenditures | 594.55 | 1,049.98** |
| Pharmaceutical expenditures | 53.19 | 69.00** |
| Antidepressant utilisation | Y | |
| **Demographics**: | | |
| Age | 15.2 | 15.2 |
| Female | 51.3% | 50.2%** |
| Dutch native | 78.5% | 80.6%** |
| **Educational outcomes**: | | |
| Educational track[c]: | | |
| VMBO | 56.3% | 67.6%** |
| HAVO/VWO | 43.7% | 32.3%** |
| Total years of education[d] | 14.5 | 13.5** |
| **Parental background[e]** | | |
| Father's age | 48.1 | 48.1 |
| Mother's age | 45.4 | 45.3 |
| Father native | 81.8% | 85.1%** |
| Mother native | 78.3% | 81.0%** |
| Single parent household | 18.7% | 28.8%** |
| Father's years of education | 14.0 | 14.0 |
| Mother's years of education | 13.1 | 13.2* |
| Fathers income | €65,597.24 | €66,186.12 |
| Mothers income | €24,367.24 | €25,169.15** |
| Household income | €78,402.30 | €72,973.35** |
| Number of individuals | 153,478 | 14,134 |

(a) all individuals with positive mental healthcare spending in 2012, (b) Annual healthcare utilisation measured in 2012, (c) educational track in grade 4, (d) Total years of education corresponding to the highest completed level of education in 2022, (e) Parental background measured in 2012

9.2% of the entire sample received some form of mental health treatment in 2012, with an average spending of approximately €4300,-. In terms of non-mental healthcare utilisation, those receiving mental healthcare are also more likely to use pharmaceuticals and their non-mental health expenditures are approximately twice as large as those of the full sample. This thus indicates the presence of comorbidities.

In 2012, the students were in the fourth grade of high school and their average age was approximately 15. Females and Dutch natives are over-represented in the sample receiving mental healthcare, indicating that they have a higher propensity to receive treatment. In terms of educational level, students in the Netherlands are tracked from age 12 onwards into three tracks: VMBO, Havo and VWO with VMBO being the lowest educational level and VWO the highest. Slightly more than half of all students are in the lower 4-year VMBO track, with the remaining students being either in the 5-year HAVO or 6-year VWO track. Mental healthcare utilisation is significantly higher in the lower VMBO track.

There are also notable differences in parental characteristics between students receiving mental healthcare and the full population of students. Similar to their own nationality, parents of children receiving mental healthcare are also more likely to be Dutch natives. Additionally, students receiving mental healthcare are much more likely to live in single-parent households. The higher mothers' income of students receiving mental healthcare is driven by the fact that more of these mothers are single-earners. Total household income is significantly lower among the sample receiving mental healthcare driven by the larger share of single-parent households.

Summing up, the descriptive statistics show that approximately 1 in every 10 children received some form of mental healthcare before the intervention. Mental healthcare utilisation was higher among Dutch natives and females and for students in the lower educational VMBO track. Differences based on parental education are limited. To determine whether the intervention has differentially affected different subpopulations, heterogeneity analysis will be performed based on these background characteristics.

# 4 Empirical analysis

The staggered implementation of the screening moment as shown in Figure 3 creates quasi-exogenous variation in treatment status. This variation can be used in a difference-in-difference setup to estimate the causal impact of the screening moment. The treatment status in this setup depends on three different aspects: the region a student lives in, the cohort year of the student, and the grade the student is currently in. Students living in a treated region become treated once they reach the fourth grade if their cohort year is greater or equal to the implementation year in that region.

It is important to note that the estimation strategy differs based on the outcome of interest. For healthcare utilisation, the outcome is observed over time, both before and after the screening moment. However, the educational and labor market outcomes are only observed after treatment.[6] For these outcomes, repeated cross-sections must be used to estimate the impact of the screening moment. Subsection 4.1 first discusses the exact estimation strategies and results for healthcare utilisation. The estimation strategy and results for educational and labor market outcomes are discussed in Subsection 4.2. Subsection 4.3 finally discusses heterogeneity of the impact of the screening moment.

## 4.1 Impact on healthcare utilisation

Healthcare utilisation is observed annually both before and after treatment occurs. This makes it possible to compare the evolution of healthcare utilisation over time of students who do and students who do not receive the screening moment through a standard difference-in-difference analysis. Recent literature has shown that comparisons between already-treated and not-yet-treated students in a staggered-implementation framework can lead to biased estimates Goodman-Bacon (2021); Borusyak et al. (2021). To avoid these biases, I implement the (Callaway & Sant'Anna, 2021) estimator. This estimator computes separate event studies for every control group with a different implementation date. A weighted average of these separate event studies is then computed to obtain

[6]Note that labor market outcomes are also observed at younger ages but equal to zero by construction. This would mechanically equate the pre-trends without being informative about the post-intervention parallel trend assumption.

average dynamic treatment effects. I thus estimate the following specification for each implementation year.

$$H_{irt} = \sum_{l} \beta_l D_{ir} * \tau_t + \tau_t + \tau_r + \varepsilon_{irt}$$

with H a measure of healthcare utilisation for individual $i$ in region $r$ and calendar year $t$. $\beta_l$ are the parameters of interest, as they show the deviation in healthcare utilisation of all students in treated cohorts ($D_{ir} = 1$) compared to students in untreated cohorts. This deviation is normalized to zero in the year prior to the implementation of the screening moment. $\tau_r$ and $\tau_t$ are region and calendar time fixed-effects. The analysis includes the 2012 to 2015 cohorts, to ensure that all students can be followed for at least 2 years before until 5 years after the intervention. The analysis relies on the parallel trends assumption. The treated student should have had the same evolution of healthcare utilisation as the untreated students, had they not been treated. The pre-implementation $\beta_l$ estimates can be used to test the parallel trend assumption.

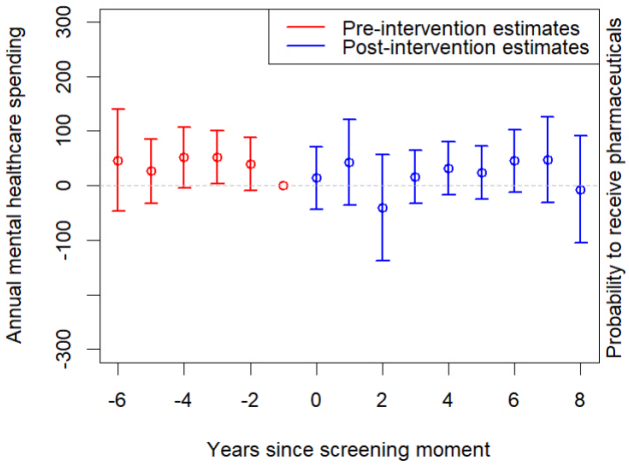
Figure 4 shows the estimated event-study impact on mental healthcare expenditures, physical healthcare expenditures and the use of pharmaceuticals. For all three measures, the pre-implementation estimates are centred around zero implying that students in treated regions followed similar trends as students in untreated regions in the six years before the actual screening moment took place. The post-intervention estimates show that utilisation of mental healthcare, physical healthcare and the use of pharmaceuticals are not affected by the screening moment. For mental healthcare and pharmaceuticals, null effects are found on both the probability of use and annual spending. [7]

The null effects on healthcare utilisation are in contradiction to the conclusions found in the pilot study of the screening moment. One potential explanation for this contradiction is that students with health issues are referred to non-healthcare specialists. Students could for example be referred onward to (school)-counselors or youth workers. Alternatively, students being referred onward to care in the screening moment might also have sought care elsewhere in the absence of the screening moment. To confirm or reject these two explanations, I examine the impacts on educational outcomes.

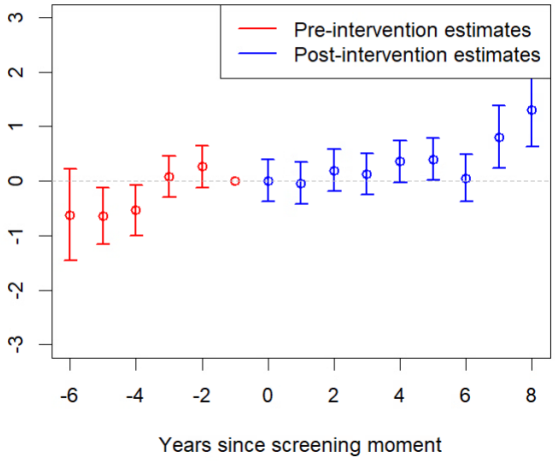
[7] Placebo estimation on earlier cohorts also shows no significant impacts on healthcare utilisation.

Figure 4: Estimated event-study estimates and 95% CI of the impact of the screening moment on healthcare utilisation

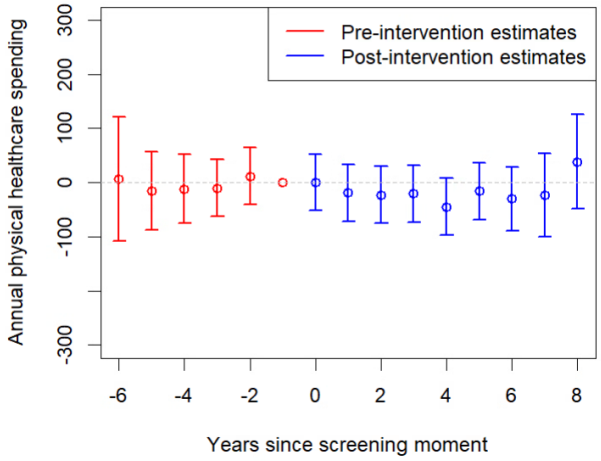
(a) Mental healthcare expenditures




(b) Pharmeceutical utilisation




(c) Physical healthcare expenditures



## 4.2 Impact on educational and labor market outcomes

While the previous section indicates null effects of the screening moment on healthcare utilisation, the screening moment could have impacted non-healthcare aspects such as the use of school counsellors or youth workers. If this were to be the case, one might expect to see improvements in non-healthcare-related longer-term outcomes. This section therefore examines impacts on educational and labor market outcomes. From a methodological perspective, this creates a challenge as these outcomes are only observed at later ages after the screening moment has taken place. It is thus no longer possible to analyse the evolution of the outcome over time before and after the intervention. To resolve this challenge, variation in treatment status between cohorts across regions is exploited.

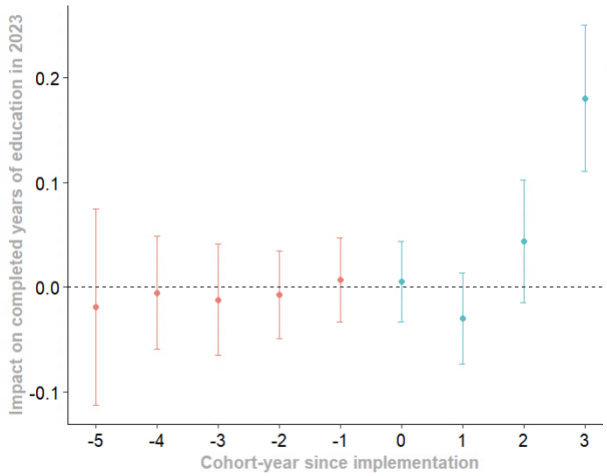
In untreated regions, all subsequent cohorts are untreated. In treated regions, cohorts that reach fourth grade before the year of implementation are untreated, while cohorts that reach fourth grade after the year of implementation are treated. This variation in treatment status can be exploited to estimate the impact of the screening moment on post-treatment outcomes. The methodological approach is similar to that used for the impact on healthcare utilisation. There are two main methodological differences compared to the analysis of healthcare utilisation. First of all, every individual is in the data only once. The outcome for this individual is measured at a fixed age. I consider outcomes when students are either 21 or when they are 24. The second main difference is that the "time" variable in all plots is cohort-year since implementation instead of calendar-years since implementation.[8]

Figure 5 shows the estimated impacts when looking at outcomes measured at age 21. For illustrative purposes, assume that the screening moment is implemented in all treated regions in 2012. This implies that in treated regions, the 2009 until 2011 cohorts are untreated while the 2012 until 2015 cohorts are treated. The event-study analysis compares the outcomes of these subsequent cohorts to the 2009 to 2015 control cohorts, which are all untreated. The estimate corresponding to -3 on the x-axis in Figure 5 for example compares the cohort that was in the fourth grade 3 years prior to the implementation in the treated region, to the same cohort in the control regions. In the setting

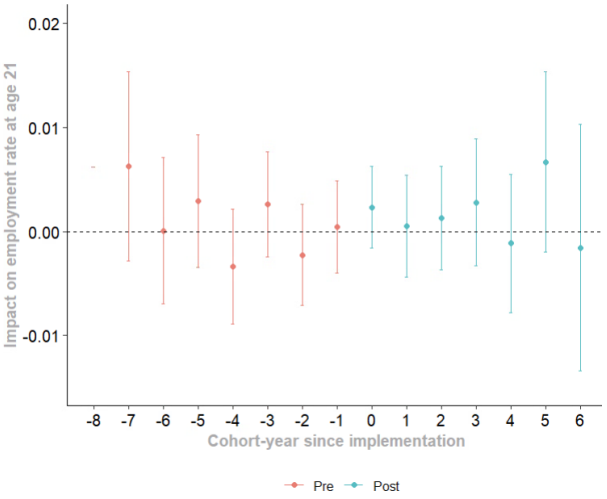
[8]This methodological approach can also be used for healthcare utilisation. The results are similar.

Figure 5: Estimated event-study estimates and 95% CI of the impact of the screening moment on educational and labor market outcomes at age 21

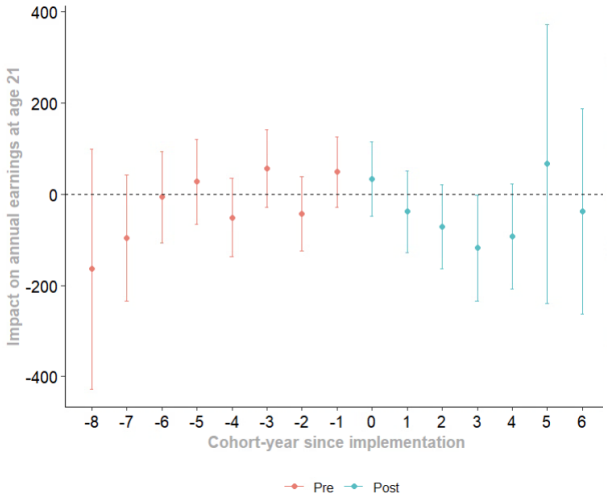
(a) Years of education



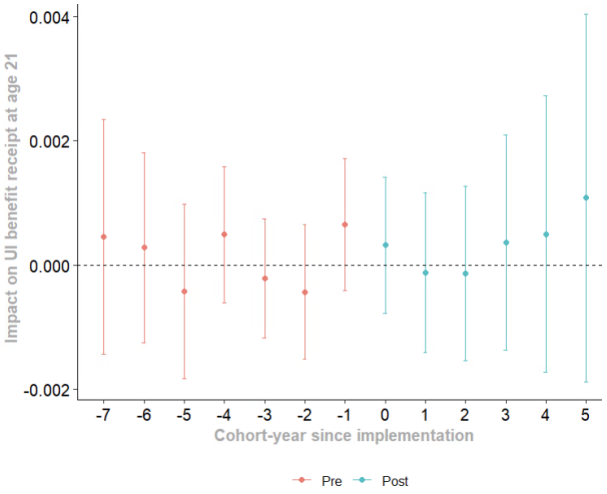

(b) Employment



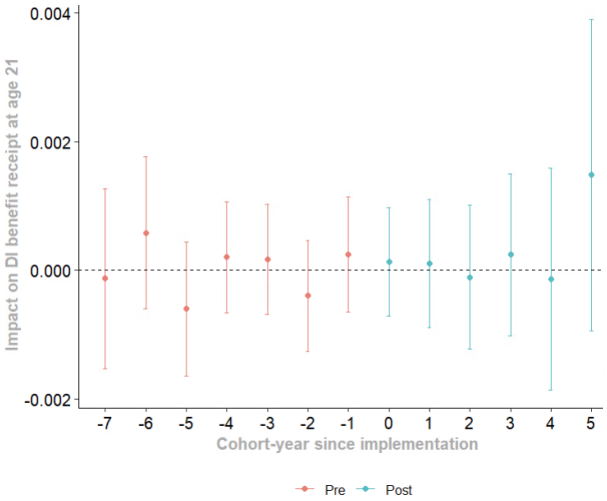

(c) Earnings



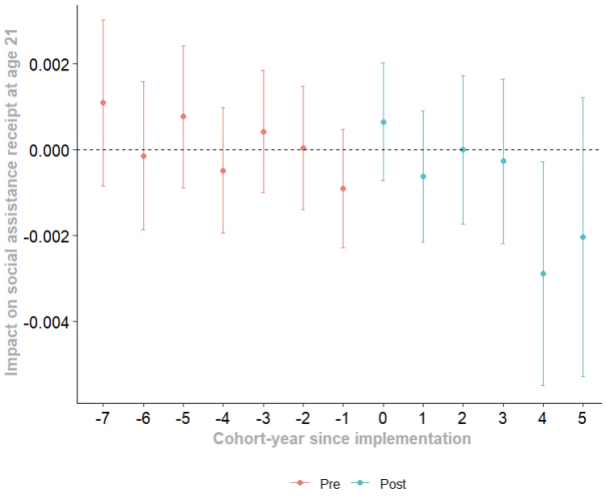

(d) Unemployment benefits




(e) Disability benefits




(f) Social assistance



where the screening moment was implemented in 2012, this point thus compares the 2009 cohorts in the treated region to the 2009 cohort in the control region. Both of these cohorts are untreated and all of the estimates prior to 0 thus test for parallel trends in the cohort-by-cohort evolution before the screening moment was implemented.

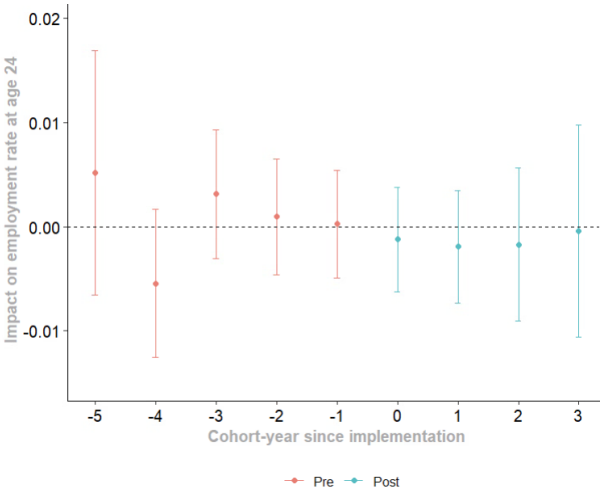
The estimate corresponding to 0 in the x-axis, compares the first cohort that received the screening moment, to a control cohort. In this example, it thus compares the 2012 cohort in the treated region to the 2012 cohort in the control region. The treated cohort has received the screening moment and hence this estimate shows the impact of the screening moment on the outcome. The estimates for higher years should be interpreted with caution, as they compare cohorts entering fourth grade many years after the implementation of the screening moment. For these cohorts, other aspects of the healthcare or educational system might also have changed.

The estimates in Figure 5 (a) show that the total years of completed education are unaffected by the reform. The estimate for the cohort that entered fourth grade 3 years after the implementation is most likely an outlier. This estimate is only based on treated 2015 cohorts in regions where the screening moment was implemented in 2012. The estimated impacts on the various labor market outcomes for the cohorts after the implementation of the screening moment are also insignificantly different from zero.

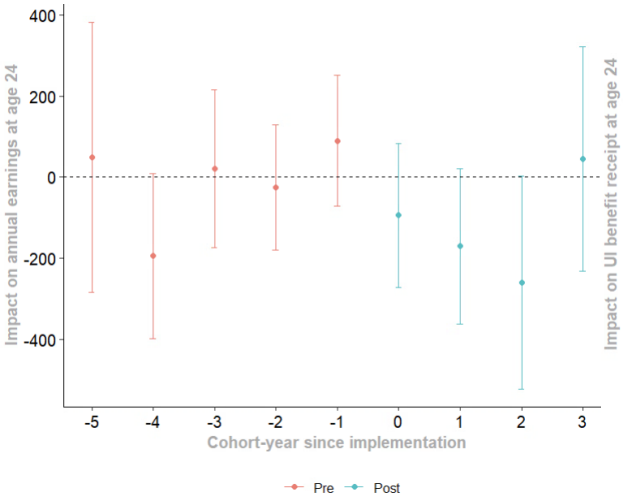
One potential reason for these null effects might be that a large share of the cohorts are still in school at the age of 21. Figure 6 therefore shows the estimated impacts when considering outcomes measured at age 24. It should be noted outcomes at age 24 are only observed for students in the 2014 cohort or earlier cohorts. The sample is therefore smaller and the treated regions correspond to providers which implemented the screening moment relatively early. The estimated impacts again suggest null effects of the screening moment on labor market outcomes at age 24. Some of the age 24 estimates are borderline significant but these significant estimates are not concentrated in one (or multiple) unique cohort and differ significantly between the various treated cohorts. The estimates should therefore be interpreted with caution.

Figure 6: Estimated event-study estimates and 95% CI of the impact of the screening moment on educational and labor market outcomes at age 24

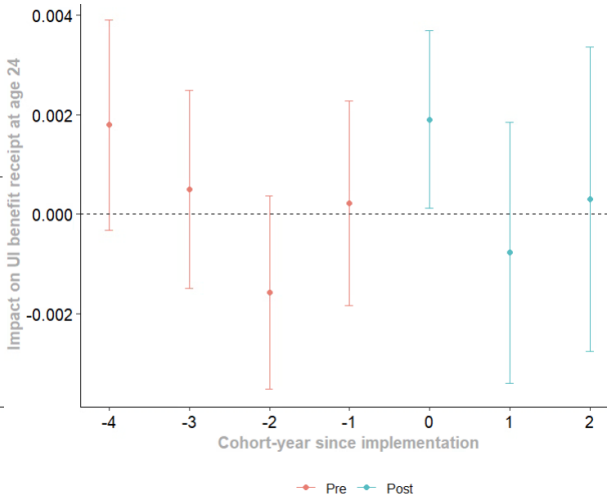
(a) Employment



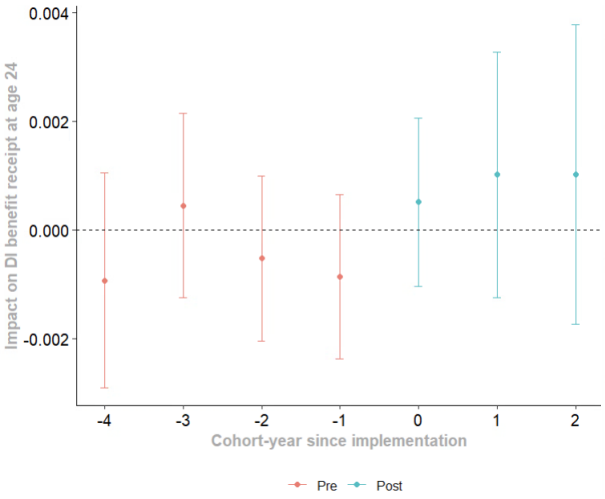

(b) Earnings



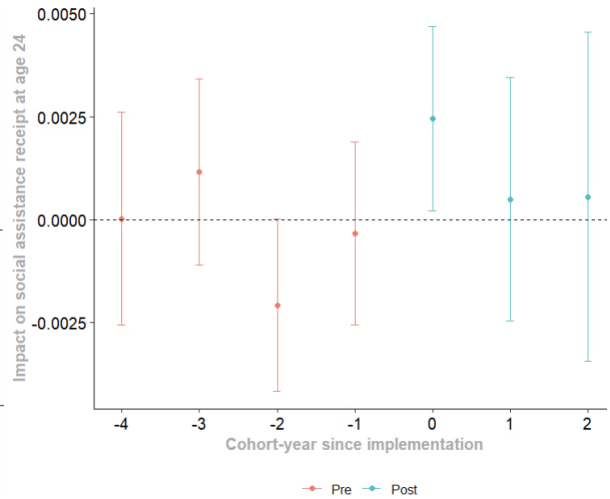

(c) Unemployment benefits




(d) Disability benefits




(e) Social assistance



### 4.3 Heterogeneity of impact

The screening moment was introduced to uncover health issues among students who were not receiving treatment yet. Given that the uptake of treatment can differ strongly between various subgroups of the population, the screening moment might have affected these different subgroups differentially as well. Specifically, for a fixed level of health, subgroups with an ex-ante low probability of using treatment could have benefited more from the screening moment. If this would be the case, the gap in treatment uptake between these groups should decline.

To test whether this is indeed the case, I re-estimate the event-study specifications using split sample analysis. Note that the utilisation of care is highest among females, students who followed the lowest educational track (VMBO) and students from either single-parent or below-average household-income families. These differences in treatment uptake could either be caused by a higher propensity to use care conditional on health, worse health, or a combination of both.

The split sample analysis however shows that the screening moment did not impact any of the healthcare, educational or labor market outcomes for any of the subgroups considered (specific subgroup estimates available upon request). The screening moment was thus also not successful in increasing treatment uptake among groups with low pre-intervention healthcare utilisation.

## 5 Conclusion

The onset of the majority of all mental health issues occurs during childhood and these childhood mental health issues are associated with a wide range of negative short- and long-term outcomes (Currie et al., 2010; Goodman et al., 2011). Despite this negative association, less than one-in-two children with mental health issues receive treatment for these issues (Merikangas et al., 2010). To increase the uptake of treatment, the Dutch government introduced a (mental) health screening moment in high school. The screening moment takes place when students are aged 16/17, closely following the median age of onset of mental health issues of 14.5 (Solmi et al., 2022). A pilot study ran prior to

the national roll-out of the intervention showed that one in ten students was referred to specialised care due to the screening moment.

By exploiting the staggered roll-out of the screening moment throughout the Netherlands, I show that the screening moment does not significantly impact the utilisation of mental or physical healthcare or the use of pharmaceuticals. I subsequently analyse the impact on educational and labor market outcomes and found no significant improvements. The total completed years of education of students who are screened for health issues in high school is similar to that of untreated students. Looking at labor market outcomes there is no significant impact of the screening moment at the age of 21 and 24.

The null effects found in this paper contradict the results of the pilot study on the screening moment. This contradiction between the pilot study and the results in this paper highlights the need for ex-post causal analysis of policy reforms. Furthermore, the null results found in this paper are very different from the positive impacts found by Golberstein et al. (2023) when looking at the introduction of school-based mental health services. The main difference between these interventions is that most SBMH interventions, including the one studied by Golberstein et al. (2023) introduce the provision of care at schools, while the screening intervention only screens for health problems and refers onward to already existing care providers.

Returning to the title of this paper; Is asking enough? The answer to that question seems to be no. In its current format, asking students about their (mental) health issues and referring them to specialised care if needed is not enough to increase treatment uptake and improve long-term outcomes.

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# A Appendix

Figure A.1: The geographic catchment area of the 30 youth healthcare providers

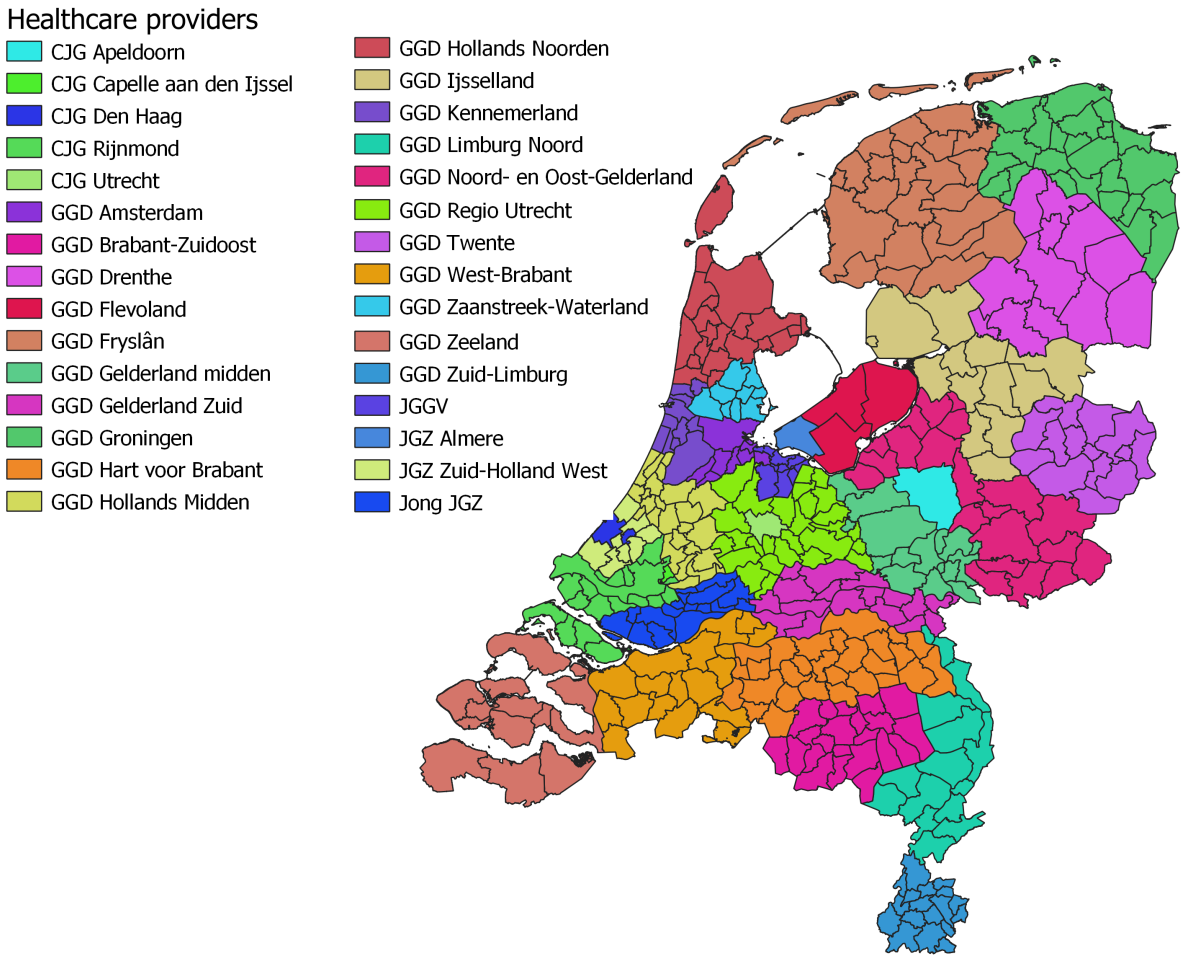



Table A.1: Construction of mental healthcare expenditures and physical healthcare expenditures based on expenditure categories used by Statistics Netherlands

| Mental healthcare | Non-mental healthcare | Pharmaceuticals |
|---|---|---|
| First-line psychological healthcare | General practitioner | Pharmacy |
| Mental healthcare | Hospital healthcare | |
| Basic-mental healthcare | Paramedical healthcare | |
| Specialist mental healthcare | Nursing without stay | |
| Geriatric rehabilitation healthcare | | |

Note: Several expenditure categories, such as healthcare abroad and other costs, as used by Statistics Netherlands are excluded from all categories as it is not clear to which category they belong.