

The 2018 PISA survey

– ensuring reliable student participation

RIR 2021:12



SWEDISH NATIONAL
AUDIT OFFICE

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We hereby deliver, in accordance with Section 9 of the Act on Audit of State Activities etc. (2002:1022) the following performance audit report:

The 2018 PISA survey

– ensuring reliable student participation

The Swedish National Audit Office (Swedish NAO) has audited whether the Government and the National Agency for Education ensured that a reliable sample of students participated in the PISA survey. The audit findings are presented in this performance audit report. The report contains conclusions and recommendations referring to the Government and the National Agency for Education.

The Auditor General Helena Lindberg made the decision on this matter. Audit director Sofia Sandgren Massih was responsible for the presentation of the report. Audit Director Christian Andersson, Auditor Frida Karlsson and Unit Director Katarina Richardson participated in the final processing.

Helena Lindberg

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Government Offices; Ministry of Education and Research
National Agency for Education

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Summary and recommendations

The Swedish National Audit Office (Swedish NAO) has audited Sweden's participation in the 2018 PISA survey, with a focus on exclusions and student non-response. Exclusions refer to students selected to sit the assessment tests but who were excluded from participating due to disabilities or limited language proficiency. Student non-response refers to students that do not turn up to the test.

The audit shows deficiencies in the National Agency for Education's (NAE) follow-up work regarding exclusions and how the Government and the NAE have dealt with the doubts that have arisen. The Swedish NAO considers it serious that neither the Government nor the NAE has convincingly followed up on the suspicions of implementation errors raised by both media and the Riksdag Committee on Education. The NAE, the OECD and the Government have argued that Sweden's low participation level in the PISA survey was due to the inflow of migrants in the years before the tests were carried out. The audit shows that this is not a valid explanation. The NAE's decision to no longer report the reasons for exclusion separately has made it more difficult to follow up erroneous exclusions.

Since the results of the PISA survey are used as a target indicator in many contexts, including in the Budget Bill, it is important that the results are reliable. If the PISA survey is not carried out reliably, it may have consequences for both educational policy and confidence in public administration.

Audit findings

Small difference in the number of newly arrived students for the 2018 tests compared with 2015

The NAE has explained the large increase in the proportion of excluded students with the large refugee flows that came around 2015. However, most students who came to Sweden in connection with the refugee crisis had been too long in Swedish schools at the time of the PISA survey in 2018 to be excluded according to OECD's criteria. The Swedish NAO's calculations show that the proportion of students who can be excluded according to the criteria for limited language proficiency has only increased by about half a percentage point for the PISA survey in 2018 compared with the survey in 2015.

Appreciated information meetings but insufficient follow-up

The school coordinators appreciated the information meetings organised by the NAE but perceived the information about exclusions in different ways. The NAE has not ensured that the information has been understood and interpreted in

accordance with the regulations, nor has it followed up whether it has been correctly applied. This has caused schools to exclude students on different premises.

The follow-up of exclusions became more difficult after the NAE's legal department made a new interpretation of the Personal Data Act in 2016. The new interpretation meant that exclusions for intellectual disabilities and limited language proficiency are now reported together. The NAE has not referred the issue to the Government in order to possibly achieve a statutory amendment, and thus more functional reporting of exclusions.

Suspicious of erroneous exclusions have not been properly investigated

Although suspicions that too many students were excluded have been raised multiple times, neither the Government nor the NAE has made any convincing efforts to investigate the issue.

It is true that the OECD was tasked with reviewing the Swedish PISA statistics once more, but the result cannot be considered an independent and credible review. OECD's conclusions are based on incorrect assumptions about Swedish schools. At the same time, the Government Offices have stated in internal memorandums that the exclusion figures cannot be explained in the way the NAE and the OECD have explained them. Despite this, the Government has continued to refer to the NAE's and the OECD's statements that everything was done correctly.

The Swedish NAO concludes that the Government has not taken sufficient measures to investigate the doubts arising in connection with the 2018 PISA survey. This is not necessarily because rules or processes are incorrectly designed. However, the Government has not fulfilled its responsibility to ensure that subordinate agencies conduct their activities in accordance with the requirements set by the Constitution.

Recommendations

The Swedish NAO makes the following recommendation to the Government:

- Initiate an investigation into the legal conditions for separate reporting of the grounds for exclusion in the PISA survey.

The Swedish NAO makes the following recommendations to the National Agency for Education:

- Improve efforts to ensure correct participation in upcoming PISA surveys. This should entail greater emphasis on the following details of the implementation:
 - Strengthen initial communication with selected schools.

- Ensure that the instructions are understood and applied correctly by the school coordinators.
- Follow up the exclusions in more detail by requesting student protocols before the survey is carried out.
- Raise the level of ambition to reduce non-response through more follow-up opportunities and use the information sent to parents/custodians to emphasise the importance of pupil participation.

Glossary

Adjudication Board – an OECD board that validates the quality of participating countries' data when in some respect they do not meet the OECD's criteria (p. 24).

Non-response – the students that do not turn up on the day of the test, despite the fact that they should, and the student test responses with too small a percentage of questions answered (p. 21).

Exclusions – a process where some students are not deemed able to take the PISA tests, despite the fact that they were selected to do so (p. 21).

Contractor – international consultant contracted by the OECD to keep together and conduct the PISA survey (p. 17).

National Project Centre – the actor in the country that is responsible for implementing the PISA survey (p. 17).

School Coordinator – a person appointed by the school principal to implement the PISA survey (p. 19).

1 Introduction

The PISA survey¹ is an international study aimed at examining the degree to which each country's education system contributes to 15-year-olds being equipped to meet the future based on the subject areas of reading, mathematics and science. The PISA survey is developed and organised by the OECD.² In many countries, the survey is an important basis for policy decisions on future development efforts, reforms and allocation of resources within schools. This also applies to Sweden, especially considering that we lack national knowledge measurements with the capacity to measure development over time. That the results provide a reliable and accurate picture of the Swedish education system is a requirement for them to contribute to a development of schools of high and equivalent quality.

In order to compare results in international studies, strict criteria are required so that equal comparisons are made. For the results to be comparable for a country over time, the criteria must also be applied in the same way for each test cycle. According to the OECD's guidelines, participating countries may exclude a maximum of 5 per cent of students to maintain consistent and comparable results. In Sweden, more than 11 per cent of the students were excluded in the latest PISA survey in 2018.

The degree of exclusion must be limited because a high proportion of excluded students entails a risk of the results not being representative of the country's education system. In addition, at least 80 per cent of selected students must complete the test in order for the results to be reliable, according to the OECD.³

1.1 Reasons for the audit

Sweden's results from the PISA survey in 2015 indicated that the downward curve for Sweden had turned. The results in all three subject areas improved. The results of the 2018 survey confirmed this picture with results in line with 2015.⁴

Immediately after the test results from the 2018 survey were published in autumn 2019, there was public questioning of how many students were excluded from the tests.⁵ Both the proportion of excluded students and the proportion of students registered as absent at the time of the test increased significantly between 2015

¹ PISA – Programme for International Student Assessment.

² Organisation for Economic Co-operation and Development.

³ OECD, *PISA 2018 Technical Report*, 2018.

⁴ National Agency for Education, *PISA 2018 – 15-åringars kunskaper i läsförståelse, matematik och naturvetenskap*, 2019.

⁵ Jällhage and Olsson, "Kritiken mot Pisa-firandet: 'Skrämmande'", 3 December 2019; Henrekson and Wennström, "Därför kan vi inte längre lita på Pisa", 17 December 2019; Letmark, "Rekordmånga nyanlända fanns inte med i årets Pisa", 4 December 2019.

and 2018. In June 2020, a long article was published stating that Sweden had excluded too great a percentage of foreign-born students from the tests.⁶ Representatives of the Government, in consultation with the National Agency for Education, then asked the OECD to conduct a review of the Swedish implementation of the survey.⁷

It is important to examine whether the PISA survey was carried out in a way that makes the results reliable and whether the Government and the Government Offices dealt reliably with the doubts that arose. Since the results of the PISA survey are used as a target indicator in many contexts, including in the Budget Bill, it is important that the results can be trusted.⁸

If it is unclear as to which students have been selected to take the tests and who have been exempted, there may be several consequences. There is a risk of harming the legitimacy of the tests and ultimately trust in central government. If the results are not reliable or representative, in the longer term there may be a risk that necessary reforms are not implemented or that central government funds are not used effectively.

In September 2020, a majority of the Riksdag Committee on Education endorsed a committee initiative that the Riksdag would urge the Government to appoint an independent inquiry into Sweden's participation in PISA in 2018.⁹ The Riksdag decided to reject the Committee's initiative with the argument that the OECD had already been asked to review Sweden's results once more. In its report, published after the Riksdag decision, the OECD notes that the large number of students excluded can probably be explained by the large reception of refugees in the years prior to the PISA survey in 2018. The OECD confirmed the NAE's assessment that Sweden's participation and results were correct. However, the Swedish NAO's assessment is that parts of the OECD's report can be questioned and that it is therefore justified to carry out another review.

1.2 Audit questions

The overall audit question is whether the Government and the NAE have ensured that the 2018 PISA survey was carried out in a reliable way in terms of exclusions and student non-response.

⁶ Hellberg, "Sveriges PISA-framgång bygger på falska siffror", 2 June 2020.

⁷ Hellberg, "Anna Ekström begär ny granskning av resultaten", 3 June 2020; OECD, *A review of the PISA 2018 Technical Standards in regard to exclusion due to insufficient language experience*, 2020, p. 4; promemoria 9 June 2020, reference material for a meeting of the Riksdag Committee on Education.

⁸ In the Riksdag data for the period 1 January 2015–31 December 2020 there are 577 document hits for the PISA survey, 125 hits for Timss, and 48 for Pirls – the last two are other international school student surveys.

⁹ Committee report 2020/21:UbU4.

To answer the overall question, we ask the following sub-questions.

1. Is an increase in the number of new arrivals a valid explanation for the high proportion of excluded students in the 2018 PISA survey?
2. Has the National Agency for Education provided clear and comprehensive instructions and relevant support on exclusions and non-response to selected schools?
3. Does the National Agency for Education have effective quality assurance and follow-up of the schools' implementation of the PISA surveys in terms of exclusion and non-response?
4. Have the government and the National Agency for Education ensured that the doubts about Sweden's participation in the PISA survey have been investigated properly?

The audit mainly covers the period of implementation of PISA 2018. By implementation, we refer to preparatory work, the implementation of the study itself and supplementary work in the form of compilation of results, follow-up and quality assurance. The audit focuses on exclusions and non-response in connection with the implementation of the survey and not on the student results.

1.3 Assessment criteria

Audit criteria are the criteria that the Swedish NAO applies to evaluate its findings. Our audit criteria are mainly based on the overall intention of the PISA survey and the regulatory framework, especially technical standards, set by the OECD for the countries' participation. We also make use of conventional requirements on the Government and Swedish agencies to provide accurate and reliable information and statistics. The grounds for assessment are operationalised based on a reasonableness assessment of how they should be adapted to the audited activities. We also take as our basis the Instrument of Government, the Government Agencies Ordinance and the Administrative Policy Bill, and their stipulations that agencies' activities should be conducted efficiently, objectively and correctly. The grounds for assessment for each sub-question are described below.

Sub-question 1. Is an increase in the number of new arrivals a valid explanation for the high proportion of excluded students in the 2018 PISA survey?

The grounds for assessment are the criteria for the exclusion of students that the OECD has drawn up for the participating countries, and whether the proportion of excluded students is in line with the proportion that could potentially be excluded according to various register data. The criteria for exclusion are set out in Chapter 2.

Sub-question 2. Has the National Agency for Education provided clear and comprehensive instructions and relevant support on exclusions and non-response to selected schools?

The OECD has developed specified criteria concerning which students should be selected to do the tests and which students may be excluded. A necessary condition to ensure that the right students are selected and then do the tests is that those who are to exclude students, in this case school coordinators in participating schools, understand and apply the rules in the way intended. Here, the NAE has an important task to ensure that the information and support provided to the school coordinators enables them to apply the criteria as intended.

We consider that the instructions from the NAE to school coordinators on exclusion rules and non-response are clear and comprehensive if the school coordinators follow the criteria in the way intended.

In the case of non-response, it is not a matter of judgement in the same way as exclusions, but is more about what information has been given about how schools can act to reduce non-response, and what is registered as non-response in the reports compiled.

Sub-question 3. Does the National Agency for Education have effective quality assurance of the schools' implementation of the PISA surveys in terms of exclusion and non-response?

When a country joins the PISA survey, the country undertakes to comply with the requirements set by the OECD for implementation. The OECD's technical standards state, among other things, the quality assurance elements necessary for successful compliance with the respective standard and which possible deviations are acceptable. Standard 21.1 states that the National Centres¹⁰ must develop appropriate mechanisms in order to promote participation and support effective implementation.¹¹ What this means in concrete terms is not specified, however. On the other hand, the OECD has produced implementation manuals for both national project managers and school coordinators. The standards and manuals available are intended to ensure high quality of implementation.

Apart from the rules that the OECD requires participating member states to follow, there are no further requirements from the Government on how the PISA survey should be implemented.¹² The Government has not taken any initiative to

¹⁰ In Sweden this is the unit for international studies at the National Agency for Education.

¹¹ OECD, *PISA 2018 Technical Standards*, 2015, p. 19.

¹² In accordance with its instructions, the NAE is to be responsible for Sweden's participation in international assessments of knowledge. In addition, the NAE, in consultation with the Government Offices, may also represent the State in negotiations and concluding international agreements on Sweden's participation in these assessments, unless otherwise decided by the Government (Section 4 of the Ordinance with instructions for the NAE (2015:1047)).

incorporate OECD requirements into Swedish legislation in order to clarify the application, so as to achieve a uniform interpretation of what is required of schools in connection with the PISA survey. However, requirements of agencies are specified elsewhere. For example, the Government Agencies Ordinance states that the agency’s management is responsible to the Government for its operations and must ensure that they are run efficiently and that the operations are reported reliably and fairly.¹³ We believe that this includes a responsibility to ensure that the documentation produced by the agency in connection with the PISA survey is reliable and accurate. It is also part of the NAE’s responsibility to follow up and evaluate the school system at national level.¹⁴

Furthermore, the Riksdag has stated that it is “very important that official statistics are of good quality and that they give a fair view of the situation and development in society”.¹⁵ Official statistics must meet the users’ information needs and expectations. PISA statistics are owned by the OECD and are not classified as official statistics but are used as a basis for decisions – for example, in connection with the Budget Bill where PISA results are used as one of several indicators to measure achievement of objectives for compulsory school.¹⁶ High requirements should also reasonably be applicable to these statistics. The NAE as an agency with statistical responsibility and responsibility for the PISA survey in Sweden is therefore the actor responsible for ensuring that the statistics reported for Sweden are of high quality and provide a fair view of the school system.

In summary, we believe that effective quality assurance and follow-up include:

- The NAE monitors any changes and problems that arise in the pilot study in an appropriate way and takes relevant measures before the main study if necessary
- The NAE monitors any indications of problems regarding student participation in the tests in connection with the main study
- If there have been errors during the implementation of the main study, the NAE takes relevant measures to prevent this occurring again in the next PISA survey.

Sub-question 4. Have the Government and the National Agency for Education ensured that the doubts about Sweden’s participation in the PISA survey have been investigated properly?

According to the Instrument of Government, administrative agencies and others undertaking public sector administrative tasks in their activities must observe

¹³ Section 3 of the Government Agencies Ordinance (2007:515).

¹⁴ Chapter 26, Section 24 of the Education Act (2010:800).

¹⁵ Govt. Bill 1991/92:118, Committee Report 1991/92: FIU23; Riksdag Communication 1991/92:316.

¹⁶ Govt. Bill 2019/20:1 UO16, Committee Report 2019/20:FiU1; Riksdag Comm. 2019/20:59. The fact that it is a target indicator is also shown in previous years’ budget bills.

objectivity and impartiality.¹⁷ The Riksdag Committee on the Constitution has interpreted this to mean that information emanating from public authorities, i.e. the State, municipalities, regions and central government agencies must be accurate, reliable and well-controlled. If the information is found to contain incorrect information, corrective action must be taken.¹⁸ In this case, this means that the Government and the NAE must act in some way when there are indications that the data provided by the NAE are inadequate and contrary to the objectivity requirements of the Instrument of Government. The NAE should evaluate how they have fulfilled their remit. Based on its responsibility to ensure that subordinate agencies conduct their activities in accordance with constitutional requirements, the Government should check whether there have been shortcomings and, if necessary, take measures to address these shortcomings.¹⁹ According to the Riksdag Committee on the Constitution, the governing function includes an obligation to lead the activities of the central government administration. Furthermore, the Committee states that this assumes that “the Government follows the activities of the agencies and, if necessary, takes the measures necessary from a governance perspective”.²⁰ In order to comply with this, there is thus reason for the Government, if doubts exist, to appoint an appropriate actor to investigate the matter if it cannot be done internally. It should also be ensured that the assignment is carried out so that both the Riksdag and the public can rely on the conclusions drawn. We call this the Government’s follow-up responsibility in relation to agencies.

The Administrative Policy Bill states that the contacts “between the Government Offices and other agencies are important elements of effective administration and should be aimed at the exchange of information and knowledge and clarifying the Government’s governance”.²¹ Regardless of the forms of Government governance and what responsibility the Government assigns to agency managements, it is the Government that is responsible to the Riksdag for how the country is governed.²²

1.4 Method and implementation

Sub-question 1: Explanation of the high proportion of excluded students

The question of what can explain the high proportion of excluded students is answered by analysing data from a number of different sources. We have collected statistics from the NAE on participating schools from the 2018 survey. To get an

¹⁷ Chapter 1, Article 9 of the Instrument of Government.

¹⁸ Committee report 2011/12:KU20, p. 161.

¹⁹ Chapter 1, Articles 6 and 9 of the Instrument of Government.

²⁰ Committee report 2012/13:KU10 p. 99.

²¹ Govt. Bill 2009/10:175, p. 101, Committee Report 2009/10:FiU38, Riksdag Comm. 2009/10:315.

²² Committee report 2012/13:KU10 p. 99.

additional picture of the number of newly arrived immigrants in participating schools, we also use other data sources, such as microdata from the PISA survey and statistics from the Swedish Migration Agency.

To clarify how the teaching of newly arrived students works in Swedish schools, we have interviewed a number of experts in education for newly arrived immigrants. To get a well-founded idea of whether there is reason to believe that the proportion of students with such great need for special support that they cannot complete the test has increased, we contacted a number of special support experts. We have also collected statistics from the National Board of Health and Welfare on the development of diagnoses for neuropsychiatric disorders (NPD diagnoses) since 2015. We have been in contact with four researchers, experts at the NAE and the Swedish Association of Local Authorities and Regions. Education for newly arrived immigrants is described in Chapter 3.

Sub-questions 2 and 3: Clear and comprehensive instructions and support measures as well as effective quality assurance

To answer the second and third sub-questions, we conducted interviews and document studies. In some cases, these have also been supplemented with written questions. The interviews were mainly conducted digitally. At the National Agency for Education, we conducted several interviews with the group responsible for the PISA survey.

We conducted interviews with 32 school coordinators at schools participating in the PISA Survey in 2018.²³ Most interviews were conducted in November or December 2020, i.e. just over two and a half years after the actual implementation of the PISA survey. This means that it has been difficult for some school coordinators to remember certain details about the exclusions, which we also consider in the audit. At the same time, we can note that many school coordinators remember very well. Being a school coordinator for the PISA survey is something unique for most people and something that stands out from the everyday school duties, which probably helps many school coordinators remember the implementation well. In cases where we have not received enough information to be sure that the school coordinator interpreted the criteria incorrectly, we have assumed that the exclusions were correct. We have also sought a wide selection of school coordinators to interview, regarding both the type of school, where in the country the school is located and the extent of exclusions and non-response the school had.²⁴ The main purpose of the interviews was to describe the problems that may have occurred in connection with the implementation. The ambition has

²³ All in all, 223 schools participated in the 2018 PISA survey.

²⁴ 8 of the schools we interviewed did not have any exclusions and 3 schools did not have any non-response. 5 schools had 10 or more exclusions, 3 schools had 10 or more students who were non-respondents. The average was 5.4 excluded students and 4.5 non-respondent students among the schools interviewed.

not been to give an exact and fully representative picture. We consider it to be impossible to achieve that, since it would have required too many resources to interview all the school coordinators. In addition, we did not reach all the school coordinators we sought, and some did not consider that they remember enough to want to talk to us.

We also interviewed former national project managers at the Mid Sweden University to get a picture of how the work of information and follow-up of exclusions and non-response was done in previous tests and what were the success factors in that work.

The documents we have collected have mainly been material from the OECD and the NAE on how participation in the PISA survey should be handled, manuals and information to national project coordinators. We have also read the information that the NAE sent to participating schools and school coordinators. We have also read follow-up reports and descriptions of the work on implementation from the National Agency for Education.

Finally, we have put written questions to national project managers in all Nordic countries and Germany.

Sub-question 4: Investigation of doubts concerning participation in PISA

To answer the fourth sub-question, whether the Government and the NAE ensured that the doubts regarding participation in the PISA survey were investigated, we have done the following: We have obtained documentation from the NAE regarding the assignment for the OECD and how they handled the assignment. We have had access to communication between the OECD and the NAE in the matter, between the contractor and the NAE and the communication between the NAE and the Ministry of Education and Research. We have also had contact with the Ministry of Education and Research and have been able to read documentation on site. In addition, we have obtained information from the OECD via email.

The audit has been carried out by a project group consisting of Audit Director Sofia Sandgren Massih (project leader), Audit Director Christian Andersson and Auditor Frida Karlsson. One reference person has submitted comments on the audit structure and on a draft performance audit report: Tanja Kirjavainen, Post-doc researcher at the University of Jyväskylä.

Representatives of the Government Offices, the Ministry of Education and Research and the NAE have had the opportunity to fact-check the report and otherwise state their views on the draft final performance audit report. The OECD has also been given the opportunity to fact-check the parts of the report that concern the OECD.

1.5 Structure

In Chapters 2 and 3, we provide background information that we deem necessary to understand the analysis chapters that follow. In Chapter 4 we answer sub-question 1, in Chapter 5 we answer sub-questions 2 and 3, and in Chapter 6 we answer sub-question 4. In the final chapter we give conclusions and recommendations. The report also contains some annexes. Annex 1 contains a description of the history of the PISA survey and how it is organised. In Annex 2 we examine how the Swedish results in the 2018 PISA survey were potentially affected by exclusions and non-response. Annex 3 consists of a review of research into exclusions and non-response in the PISA survey.

2 The PISA survey

In this chapter we give a brief description of the PISA survey. It includes Sweden's participation in the PISA survey and how the implementation is intended to be carried out. We also give a short description of exclusions, non-response and coverage.

The PISA survey is initiated and organised by the OECD. In order to carry out the survey, the OECD procures a contractor that under the leadership of the secretariat for the PISA survey, shall design and implement the survey. In practice, it is the contractor who has the dialogue with each country and provides the national project managers with instructions for the implementation.

2.1 The PISA survey in Sweden

Sweden has participated in the PISA survey since its inception in 2000. The most recent survey in 2018 included 79 countries and regions, including all 37 OECD countries. In Sweden, a sample of approximately 5,500 15-year-old students from 207 compulsory schools and 16 upper secondary schools sat the test and answered the associated questionnaire.

In Sweden, the Government has delegated responsibility for Sweden's participation in the PISA survey to the NAE.²⁵ The agency is to present the work on the PISA survey in its annual report and publish a report after each completed study. At both the annual agency dialogue and in ongoing dialogue with the agency, the Ministry of Education and Research must follow up the results that the NAE has achieved based on the agency's instruction and appropriation directions.²⁶

Since 2015, the NAE is also a national project centre for the PISA survey, which means that the agency has a national project manager responsibility for the survey being carried out according to the rules decided by the OECD. Previously, the NAE procured this function. Prior to the first PISA survey, a call for interest was sent to different universities and agencies.²⁷ The University of Kalmar was awarded the contract.²⁸ On 1 July 2002, the National Centre for the PISA survey was moved to Mid University College (Mid Sweden University from 2005).

²⁵ Section 4 of the Ordinance with instructions for the National Agency for Education (2015:1047).

²⁶ Written reply from the Ministry of Education and Research, 18 November 2020.

²⁷ National Agency for Education, *Anbudsfrågan Nationell projektledare för OECD-projekt "A strategy for Students Achievement Outcomes"*, 1997.

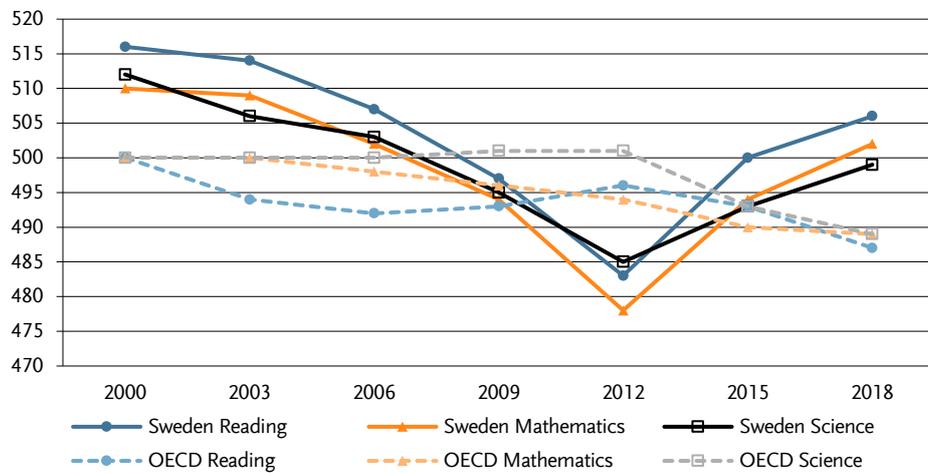
²⁸ For more details concerning project managers etc. see Fredriksson, Karlsson and Pettersson, *PISA under 15 år – resultat och trender*, 2018.

In connection with the survey in 2015, the NAE took over project manager responsibility from Mid Sweden University. The reason for this was primarily an ambition to gather all major international knowledge surveys in one department at the NAE and that coordination opportunities would reasonably lead to better cost-effectiveness. Another reason was the increasing focus on the PISA survey, which entails high knowledge requirements concerning the implementation. The NAE argued that this knowledge could best be obtained if the study was implemented by the agency.²⁹ Mid Sweden University was responsible for the implementation in 2015, but the NAE wrote the final report and thereafter took over all responsibility. Project manager responsibility now lies with the International Studies Unit, where the responsibility for other international studies also lies.

2.1.1 Sweden’s results in the PISA survey 2000–2018

Sweden’s result was at its best on the first occasion and then gradually declined up to and including 2012. Since then, the results have again improved, in particular there was a statistically significant improvement between 2012 and 2015. Pisa 2018 showed that the Swedish results in reading, mathematics and science were back at the same levels as in 2006, when the sharp decline in results began. Figure 1 shows results in the three subject areas.

Figure 1 Sweden’s performance in the PISA survey compared with the OECD average, 2000–2018



Source: OECD’s performance reports.

²⁹ National Agency for Education, *Förslag angående kommande PISA-cykler*, reference number 1.1.2-2015-0180, 2014.

In Pisa 2018, Swedish students performed at a level higher than the OECD average in all three subject areas. Compared to Pisa in 2015, the measured score increased in all subject areas, but the improvement was not statistically significant.³⁰

2.2 Implementation of the PISA survey

2.2.1 School coordinator – an important function

To ensure compliance with the rules decided by the OECD in the schools, each participating school must choose a 'school coordinator'. The school coordinators are to act as a contact person between the school and the national project manager.³¹ It is the principal of each school that decides who should be the school coordinator; usually an assistant principal or teacher is appointed. Since the students (since 2015) complete the test and questionnaires on computers, schools must also appoint an IT manager who will support the school coordinators at the time of the tests.³²

The school coordinators play an important role in providing the NAE with lists of which students are present at the school and thus are included in the target group to take the test. It is also the school coordinators who will then identify which students meet the OECD's criteria for exclusion and should therefore be exempt from taking the tests. The school coordinator must also inform other staff and students about the survey.³³

Although there are detailed rules from the OECD for much of the work with the school coordinators, the NAE plays an important role in ensuring the quality of participation. The NAE's role includes training and providing support to the school coordinators in which rules apply to selection, exclusion and non-response. The NAE must also ensure that the rules are applied and provide the school coordinators with relevant manuals for how the tests should be carried out. The work also includes translating and adapting the manuals decided by the OECD so that they are of use in the Swedish context and inform the parents/custodians of the PISA survey. The translation must be done through one of the OECD-specific translation processes in order to avoid any deviations from the standards.³⁴ The manual decided by the OECD for national project managers also states that the NAE must ensure that the student lists collected from each participating school are of high quality.³⁵

³⁰ National Agency for Education, *PISA 2018 Huvudstudie – manual till skolsamordnare*, 2018.

³¹ Ibid.

³² National Agency for Education, *Så här går PISA till – en sammanfattande beskrivning*, 2017.

³³ National Agency for Education, *PISA 2018 Huvudstudie – manual till skolsamordnare*, 2018.

³⁴ Ibid.

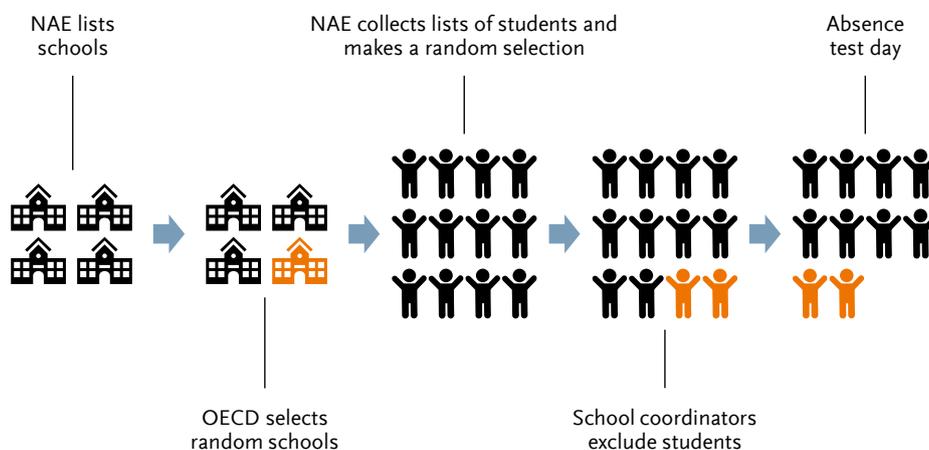
³⁵ Ibid.

2.2.2 What is the selection process?

The selection of students to take the tests takes place in several steps. Initially, all schools that have students of the right age in year 7 or above in the year before the implementation are listed. In Sweden, a full annual cohort is included in the target population, i.e. students born between 1 January and 31 December in the year in question – for the 2018 PISA survey, students born in 2002.³⁶ Special needs schools and schools for pupils with learning disabilities are marked and excluded before the selection is made, but are included in the exclusion rate. The OECD then makes a stratified random selection of school units to participate. The school coordinators are asked to fill out a student list of all students at the school born in the year in question and then also specify which students need some form of extra support in their education. There are different codes depending on the form of support the student has, for example for physical or mental disabilities, or additional language training. In Sweden, all students with some kind of extra support are encoded with the same code.

Once the student lists have been submitted to the NAE, a random selection of students is made, according to a programme provided by the international contractor. In each country, the selection must include a certain number of schools and students per school. In Sweden there were at least 150 schools and 37 students from each school in 2018. If a school does not have 37 students, all students at the school are selected. In schools with more than 37 students in the correct year and age group, a random selection of students is made. After the school coordinators learn which pupils have been selected for the tests, they must fill in a student protocol and specify which pupils should be excluded. The selection process is illustrated in figure 2.

³⁶ Countries that implement the PISA survey later in the year have divided cohorts, i.e. they are to be born for instance between the first of March and the last day of February.

Figure 2 Selection process for the PISA survey

Source: Swedish NAO.

Note: The figure is somewhat simplified.

2.2.3 Why and when can students be excluded?

For an international study to be comparable between countries and over time, as many of the selected students as possible must participate. However, it must be possible for the countries to exempt certain students from the tests, mainly because the students' test results would not say anything about the country's school system. They may be students with severe functional impairment. They may also be students who recently arrived in the country and whose level of knowledge therefore cannot be considered to be the result of the country's education system. To maintain comparability between participating countries, the exclusions allowed must be centrally defined, but also be limited. If too many students are excluded, the results of the survey cannot be considered representative of the country's school system.³⁷ The criteria for exclusion have remained unchanged since the start of the PISA survey in 2000.³⁸

As mentioned above, the first exclusions are made even before schools are selected when schools for pupils with learning disabilities and special schools are excluded. When the selection of students is then made, the school coordinators receive the lists back and must then decide if any students receiving special support cannot take part in the tests. Just because a student has some form of special support, it is not certain that they are to be excluded. In total, the exclusions may not exceed 5

³⁷ In Annex 2 hypothetical calculations have been made of how Sweden's results would potentially change in the 2018 PISA survey if the students who did not take the test had participated.

³⁸ OECD, *PISA 2003 Technical Report*, 2005, p. 3; OECD, *PISA 2018 Technical Standards*, 2015.

per cent of the target population, that is, including the excluded schools.³⁹ The OECD has the following guidelines for exclusion, with the intention of minimising exclusions:⁴⁰

- The student has a moderate to severe permanent physical disability (such as visual impairment) that means they cannot take the PISA test.
- The student has a cognitive, behavioural, or emotional disability confirmed by qualified staff, meaning they cannot take the PISA test. The functional impairment must be so severe that the student cannot follow even the general instructions of the assessment.
- The student meets all three criteria below⁴¹
 - is not a native speaker of Swedish
 - has limited proficiency in Swedish
 - has received less than one year of instruction in Swedish.

Thus all 37 students from the respective schools, minus those who have been excluded, are expected to turn up for the test. A certain number of students are not allowed to participate by their parents/custodians. In addition, there is a certain number of students who for other reasons do not show up on the test day. Both groups are encoded as non-respondents in the statistics. In addition, not all students who participate can complete the test. If they have not answered enough questions, the test is not counted, but these tests are also counted as non-response. However, it is a very small proportion of students who are counted as non-respondent for this reason (less than one per cent).⁴²

2.3 Exclusions, non-response and coverage over time

2.3.1 Exclusions in Sweden and other countries

After the NAE's legal department re-interpreted the now revoked Personal Data Act, the individual exclusion categories may not be reported separately, but only the total number of excluded students may be reported.⁴³

In 2018, 681 students were excluded, which is just over 11 per cent of the students selected to sit the tests. Of these, 9.8 percentage points were exclusions of students and the rest were exclusions of schools – schools for pupils with learning disabilities and special schools. In 2015, a total of 275 students were excluded, of which 154 due to functional disabilities and 121 due to limited language

³⁹ The exclusion rate is calculated as the number of excluded students divided by the number of students who would have participated if neither schools nor students had been excluded.

⁴⁰ OECD, *PISA 2003 Technical Report*, 2005, p. 3; OECD, *PISA 2018 Technical Standards*, 2015.

⁴¹ In other countries it is of course the language in question that applies.

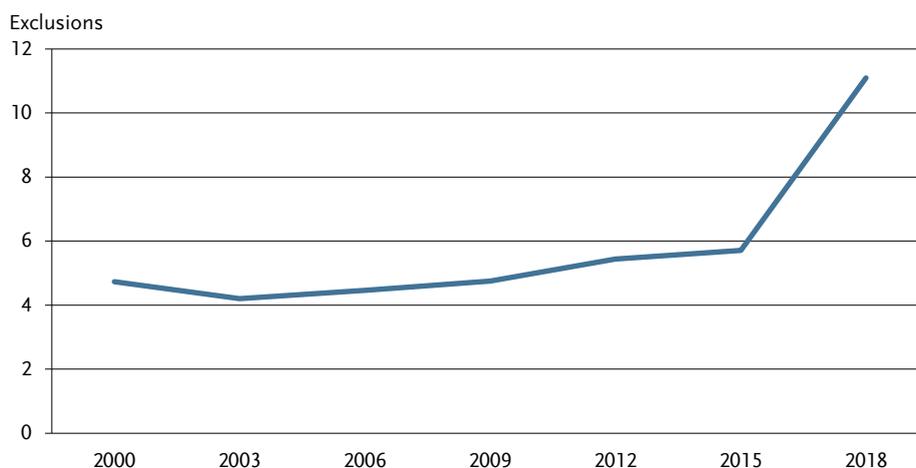
⁴² Email from the OECD, 11 December 2020.

⁴³ National Agency for Education, *Hantering av exkluderingskoderna i de internationella studierna*, 2016.

proficiency. A total of just under 6 per cent were excluded in 2015, of which 4.5 percentage points were student exclusions.

Sweden has reported a gradual increase in the proportion of exclusions between 2003 and 2015. However, between 2015 and 2018 the exclusion rate rose by 94 per cent, see figure 3. In 2018, there were 25 schools that excluded 8 or more students, i.e. more than 20 per cent of the selected students.

Figure 3 Sweden's exclusions in the PISA survey 2000-2018, per cent



Source: Statistics from the OECD processed by the Swedish NAO

If we look at the different reasons for exclusion separately, we can see that the proportion of schools and the proportion of those excluded due to disabilities developed in the opposite direction during the period when the reasons were separately reported. The proportion of excluded schools has decreased, and the proportion of students excluded has increased. This is because it is becoming increasingly common for students with disabilities to be integrated into ordinary schools. Up to and including 2015, the total number of students excluded either through schools for pupils with learning disabilities and special schools or through disabilities remained relatively constant at just under 4 per cent. According to the NAE, there is reason to believe that there was a certain double exclusion of students enrolled in schools for pupils with learning disabilities, which means that students were excluded both at school and student level. According to preliminary calculations, the Swedish exclusion rate may be overestimated by 0.5 percentage points.⁴⁴

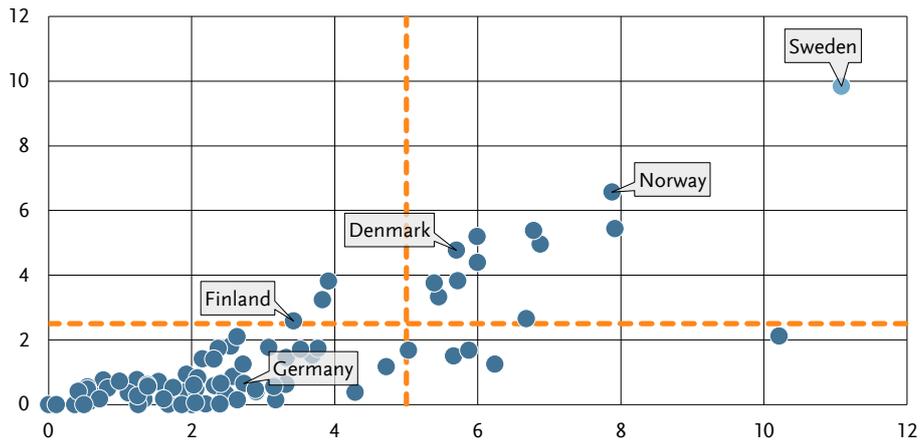
According to data from the National Board of Health and Welfare on adolescents with neuropsychiatric diagnoses, we can see that the number of adolescents with

⁴⁴ National Agency for Education, *PISA 2018 – 15-åringars kunskaper i läsförståelse, matematik och naturvetenskap*, 2019, p 62, footnote 108.

diagnoses has increased by about 20 per cent since 2015.⁴⁵ All adolescents with diagnoses should not be excluded, but only those with such serious problems that they cannot follow the general instructions for the tests. However, an increase in the total indicates that the proportion of exclusions due to neuropsychiatric disabilities may have increased. Under the assumption that exclusions due to physical or cognitive disabilities have not changed, but that behavioural and emotional disabilities may have increased by about 20 per cent, this gives an exclusion rate of just under 3 per cent.⁴⁶ Since Sweden had almost 10 per cent student exclusions in 2018, almost 7 percentage points remain to be explained.

In 2018, Sweden had the highest exclusion rate of all participating countries, including partners.⁴⁷ Several countries had a total exclusion rate above 5 per cent, which is the limit accepted in advance by the OECD. Sweden is also at the highest of all countries when it comes to student exclusions where the OECD has set a limit of a maximum of 2.5 per cent exclusions. This is illustrated in figure 4.

Figure 4 Total exclusions (x-axis) and student exclusions (y-axis) for different countries in the 2018 PISA survey, per cent



Source: Statistics from the OECD processed by the Swedish NAO.

⁴⁵ Data from the Register of Patients, delivered on 12 January 2021.

⁴⁶ In comparison at the age of 15, in the cohort born in 2002, 18 per cent more adolescents had some form of neuropsychiatric disability than in the cohort born in 1999. In 2015, 2.49 per cent of the students were excluded due to disability. We assume that 0.16 percentage points of them were excluded due to cognitive disabilities (i.e. integrated students at schools for pupils with learning disabilities), which leaves 2.33 per cent for other disabilities. $2.33 * 1.18 = 2.75$. To this figure is added again the integrated students at schools for pupils with learning disabilities in 2018 (0.17), then giving an exclusion of students with disabilities of 2.92. A total of 9.84 per cent of students were excluded in 2018, leaving 6.92 percentage points to explain. Source: Statistics from the National Board of Health and Welfare and the National Agency for Education.

⁴⁷ Partners are participating countries that are not members of the OECD.

When the exclusion rate exceeds 5 per cent, data and events are reviewed by the adjudication board at the OECD that usually approves data.⁴⁸ In table 1 the reasons given for each country's high exclusion rate are presented in connection with PISA 2018 (OECD countries). No explanations are given for those countries that are close to the 5 per cent limit.

Table 1 Countries with high exclusion rates in 2018 and OECD's reasons for accepting them

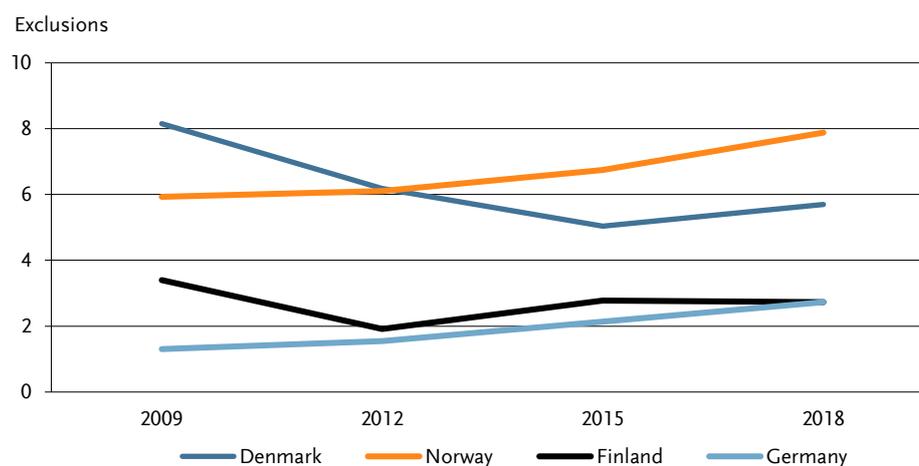
Country	Exclusion rate	Reasons
Sweden	11.1 %	Sweden's high rate is explained as a consequence of a large and temporary increase in immigrant flows.
Israel	10.2 %	Israel's high rate is explained by the exclusion of a particular type of boys' school previously considered to be non-responding schools. The schools refuse to participate.
Luxembourg	7.9 %	Since Luxembourg had consistently high exclusion rates over cycles the country's data were approved (2015 – 8.16 %).
Norway	7.9 %	Since the proportion and type of exclusions was similar to 2015 the data was approved (2015 – 6.75 %).
Canada	6.9 %	Since the proportion and type of exclusions was similar to 2015 the data was approved. In 2015 there was a discussion as to why the high non-response rate is OK, though nothing about exclusions.
New Zealand	6.8 %	Since the proportion and type of exclusions was similar to 2015 the data was approved. In 2015 the high exclusion rate (6.75 %) was considered to be due to newly arrived students with insufficient language proficiency and was therefore approved.
Switzerland	6.7 %	Unclear.
The Netherlands	6.2 %	Unclear.
Turkey	5.7 %	A new type of non-formal school was included in the sampling frame.
The United Kingdom	5.5 %	Unclear. There is an explanation of the non-response, nothing on the exclusion rate.
Iceland	6.0 %	Unclear, fairly close to 5 %.
Australia	5.7 %	Unclear, fairly close to 5 %.
Denmark	5.7 %	Unclear, fairly close to 5 %.

Source: PISA 2018 Technical Report, chapter 14.

⁴⁸ The adjudication board consists of representatives from the OECD, the contractor, the technical advisory group and the sampling referee.

In figure 5 we can see that Sweden’s neighbouring countries as well as Germany have had quite small changes in exclusion rates. Germany is included because it is the European country after Sweden that received most refugees per capita in the years between the last PISA surveys.⁴⁹ In Denmark, the exclusions within all groups have gone down except the one called Other.⁵⁰ In the other countries there have been minor increases within each group, but none stand out.

Figure 5 Exclusion rate in a selection of countries for the PISA surveys in 2009–2018, per cent



Source: Statistics from the OECD processed by the Swedish NAO.

2.3.2 Non-response in Sweden

In 2018, the non-response rate was 869 students (14 per cent), of which 161 were students whose parents/custodians informed the NAE that the student was not allowed to sit the test. In 2015, the non-response was 555 students (9 per cent), of which 28 were students whose parents/custodians did not allow them to sit the test. Thus, there has been a marked increase in the number of students who are not allowed to sit the test by their parents/custodians between the last two surveys. There is probably a mixture of reasons for the high non-response rate, which we will return to in Chapter 5.

Sweden has the seventh highest non-response rate among the OECD countries and the eighth highest non-response rate among all 79 participating countries and regions.

⁴⁹ According to statistics on asylum seekers and residence permits granted, Germany had between 80 and 85 per cent of Sweden’s per capita rate for the years 2015–2017. Data from Eurostat.

⁵⁰ It is somewhat unclear what Other consists of, but sometimes grave dyslexia or dyscalculia can be encoded in that category as the other exclusion codes do not include such difficulties, see OECD, *PISA 2018 Technical Report*, 2018.

2.3.3 Coverage

For each participating country, several rates of coverage are calculated to describe the proportion of the target population represented by the sample. The most frequently used coverage ratio (index 3) is based on the number of 15-year-olds in the country who are in the school system, and exclusions. It does not take into account the non-response rate at the time of the test. In 2018 Sweden had a coverage ratio of 86 per cent. Since almost all 15-year-olds in Sweden are enrolled in the school system, the relatively low coverage ratio is a result of the high number of exclusions, and the fact that some large schools originally selected were discontinued before the study was implemented. Mexico and Colombia are two countries with low coverage, 66 and 62 per cent respectively, since they have many 15-year-olds who no longer attend school. Sweden has the seventh lowest coverage ratio of the OECD countries.⁵¹ In all previous studies, Sweden's coverage ratio has been between 93 and 98 per cent.

An alternative coverage index has been developed by an English research group.⁵² Their coverage index is based on how many 15-year-olds are in the school system, how many schools refrained from participating⁵³, how many exclusions were made and the non-response at the time of the test. With this way of calculating, Sweden has a coverage ratio of 73 per cent, compared with Finland, Denmark and Germany, which have 88, 73 and 85 per cent respectively.

⁵¹ The following countries have a lower coverage ratio: Colombia, Israel, Italy, Mexico, Turkey and the United Kingdom.

⁵² Anders et al., "Is Canada really an education superpower? The impact of non-participation on results from PISA 2015", 2021.

⁵³ Different countries have different rules on whether it is mandatory or not for schools to participate.

3 Migration before the 2015 and 2018 PISA surveys and description of education for newly arrived immigrants

As a background to the analyses made in coming chapters, this chapter describes the migration situation in Sweden before the PISA surveys in 2015 and 2018 and how the education system works for newly arrived students in Sweden.

3.1 The number of asylum seekers was at its highest in 2015 and has since then decreased

The refugee situation in 2015 was unique, Sweden has never before received as many asylum seekers as in that year. In total, more than 163,000 people applied for protection in the country, most of them within a few months.⁵⁴ The largest number came in 2015 and since then the number has decreased every year.

To illustrate the numbers of newly arrived students in connection with the PISA survey, we show how many people applied for asylum or were granted residence permits on other grounds in the years prior to the 2015 and 2018 PISA surveys.⁵⁵ The rules for applying for a residence permit differ depending on the reasons for the application. Persons applying for asylum in Sweden must submit their application in the country, either when entering or at one of the Migration Agency's application units.⁵⁶ As an asylum seeker, you are entitled to education in Swedish schools.⁵⁷ For persons applying for a residence permit on other grounds, the application must usually be submitted from their home country. It is only after the decision to grant a residence permit that the person is registered in the country and compulsory schooling thus begins.⁵⁸ Figure 6 shows the number of individuals from the PISA cohorts who had applied for asylum while

Figure 7 shows the number of individuals granted a residence permit on other grounds in the two years before the 2015 and 2018 PISA surveys.

⁵⁴ Swedish Migration Agency, "Fem år sedan flyktingsituationen 2015", retrieved on 17 December 2020.

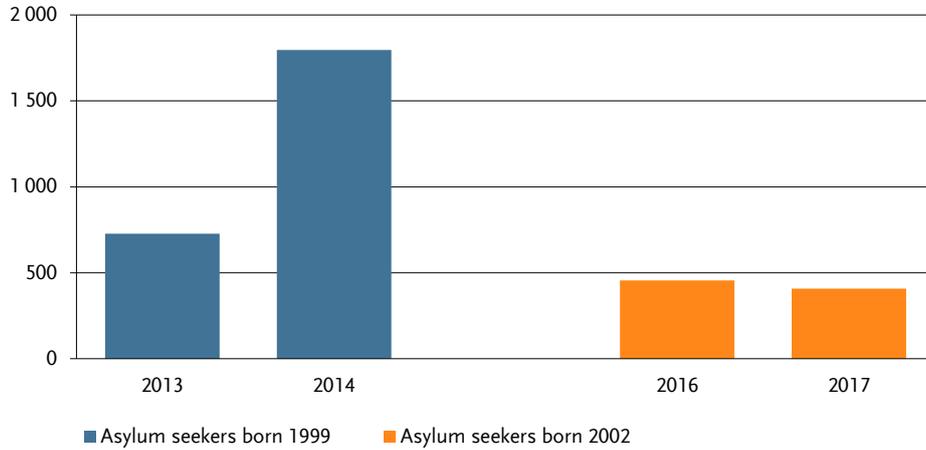
⁵⁵ Other grounds refer to individuals granted residence permits on grounds of family reunification, work (including relatives) and studies (including relatives).

⁵⁶ Swedish Migration Agency, "Asylregler", retrieved 15 February 2021. here are also people who have been granted asylum as quota refugees. The person will then come to Sweden after a decision to grant a residence permit. In 2017, 136 individuals born in 2002 were granted residence permits as quota refugees.

⁵⁷ Chapter 29, Sections 2-4 of the Education Act (2010:800).

⁵⁸ Chapter 29, Section 2 of the Education Act (2010:800).

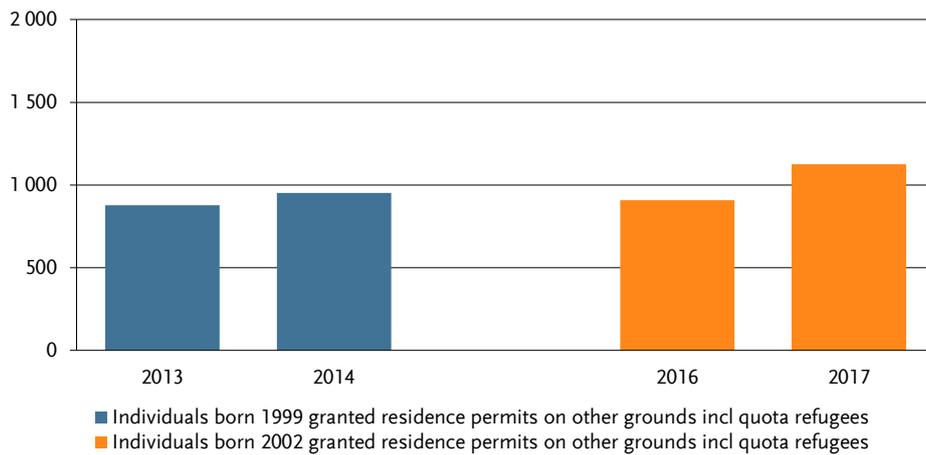
Figure 6 Number of individuals born in 1999 and 2002 respectively who applied for asylum in Sweden in the years before the Pisa surveys in 2015 and 2018



Source: Statistics from the Swedish Migration Agency processed by the Swedish NAO.

Figure 6 shows that more individuals born in 1999 applied for asylum in the years before PISA 2015 than individuals born in 2002 who applied for asylum in the years before PISA 2018. A total of 2,524 individuals belonging to the PISA cohort applied for asylum in the two years prior to the 2015 survey. This is compared to 864 individuals from the PISA cohort two years before the survey in 2018.

Figure 7 Number of individuals born in 1999 and 2002 respectively who were granted residence permits on grounds of family reunification, work (incl. relatives), studies (incl. relatives) and as quota refugees in the years before the PISA survey



Source: Statistics from the Swedish Migration Agency processed by the Swedish NAO.

Figure 7 illustrates the corresponding figures for persons granted residence permits on other grounds and shows that the number of individuals granted residence permits on these grounds was slightly higher in the years prior to the 2018 PISA survey compared with 2015 (2,034 and 1,829 individuals respectively).

3.2 Education for newly arrived students is in Swedish

Children registered as resident in Sweden are required to attend school. As described in the previous section, children who live in Sweden but are not registered are also entitled to attend school. This applies to asylum seekers and undocumented migrants.⁵⁹ The home municipality is obliged to offer a student schooling within one month of the student being notified to the municipality. After that, it may take up to two months to screen the student, but then the student must be placed in a class in a school.⁶⁰

There are mainly two ways to organise education for newly arrived immigrants in Sweden. One is through direct integration, when the student goes directly into ordinary class. The other is through the preparatory class, when the student for part of the time is in a class with only newly arrived immigrants. Opinions differ as to which model is best for the students.⁶¹ Which model that is used depends on a variety of factors. It may depend on how many newly arrived students the school authority has, but also on what model that specific authority considers to be the best, the availability of teachers, financial conditions, and a variety of other factors.

3.2.1 Teaching in preparatory class

Thus, some municipalities have preparatory classes for newly arrived immigrants. Students attend these, usually part-time, during a transitional period before they are fully part of an ordinary class. Even in municipalities where there are preparatory classes, there may be schools that do not use them, but instead integrate the newly arrived students immediately into ordinary classes. The idea of preparatory classes is that the students that attend them will gradually be integrated into regular tuition. According to the Education Act, teaching in preparatory classes must be discontinued as soon as the student is judged to have sufficient knowledge of Swedish to participate in an ordinary class.⁶² Integration into ordinary class often start with practical-aesthetic subjects and then gradually move towards all tuition in an ordinary class. Students should not receive all their tuition in a preparatory class.⁶³ All students in the preparatory class have their

⁵⁹ Chapter 29, Sections 2-4 of the Education Act (2010:800).

⁶⁰ Chapter 3, Section 12 d of the Education Act (2010:800); Chapter 4, Section 1 a of the Schools Ordinance (2011:185).

⁶¹ Tajic and Bunar, "Do both 'get it right'? Inclusion of newly arrived migrant students in Swedish primary schools", 2020.

⁶² Chapter 3, Section 12 of the Education Act (2010:800).

⁶³ National Agency for Education, *Utbildning för nyanlända elever*, 2016, p. 27–28.

individual schedule. The teaching takes place in Swedish, regardless of the student's native language, and must follow the curriculum and syllabuses for the type of school in question – just as for all students. All students, even in preparatory class, are entitled to instruction in all subjects in accordance with the national curriculum. Since 2015, it has been regulated that students are not allowed to attend preparatory classes for more than two years.⁶⁴

Students whose native language is not Swedish can be taught and receive study guidance in their native language. When this is the case, it is a complement to the regular instruction in Swedish and never instead of it. This applies to all pupils with a native language other than Swedish, regardless of whether they are in preparation class or not. When students have attended a year of preparation class, they have received one year of tuition in Swedish, the same as if they had been put in a school that applies direct integration of newly arrived students.

It is not possible to obtain precise statistics on the proportion of newly arrived students in preparatory class, nor how long they attend these classes. Our assessment after the discussions we have had with experts in the field and school coordinators is that it is unusual for students to attend for the maximum period, i.e. four terms. A year in preparation class seems to be normal. The best estimate of how common preparatory classes are is probably the one made in a report from the Institute for Evaluation of Labour Market and Education Policy (IFAU).⁶⁵ Of the 138 municipal school authorities that responded to the survey questionnaire, 65 per cent had preparation class for students in years 4-9, 22 per cent of the students were initially placed almost full-time in the preparation class and 43 per cent were placed part-time in preparation class.

3.2.2 Teaching of or in Swedish

In the OECD regulations concerning the PISA survey, one of the criteria for exclusion is stated as if students “have received less than one year of instruction in the assessment language”. In Sweden, this has been translated as the students having received less than one year's teaching *of* Swedish. In connection with the discussions around the high exclusion rates in 2018, the NAE has had a discussion with the contractor about whether it is a correct translation, or whether it should be teaching *in* Swedish instead. All the experts and school coordinators we discussed the issue with have clarified that preparatory class instruction is of Swedish in Swedish. We do not consider that the issue has significance in connection with this audit.

⁶⁴ Chapter 3, Section 12 of the Education Act (2010:800).

⁶⁵ Mörtlund, *Arbetet med nyanlända elever i grundskolan – En enkätundersökning om arbetet med nyanlända elever hos kommunala huvudmän för grundskolan*, 2020.

4 An increased number of newly arrived immigrants is not a valid explanation

In this chapter we answer the question of whether the increased number of newly arrived students in the years prior to the 2018 PISA survey is a valid explanation for the high exclusion rates in the 2018 PISA survey. By valid explanation, we mean that the exclusions have been made in accordance with OECD criteria.⁶⁶

Our conclusion is that the high refugee immigration to Sweden is not a valid explanation for the high exclusion rate. The proportion of pupils who can be excluded due to limited language proficiency is estimated to be about 2.5 per cent, i.e. about a half percentage point increase compared with 2015.

4.1 Limitations of available statistics

There are some limitations in available statistics in terms of answering this sub-question. To begin with, we do not know which students were actually excluded. We know how many students were excluded at each school, but not who these students were. We know how many newly arrived students there were at each participating school, but not exactly how long they had attended Swedish school. We have data on the population registration month for most students, but how long a student has resided in Sweden before that differs between individuals and between grounds for residence permits. We can see flows of students with a foreign background from year to year, but not the time of year students started school. We know how many students applied for a residence permit during the period before the tests and how many were granted residence permits, but we cannot connect these data with each other.

Due to these limitations, we make several different calculations and assumptions to ensure that we answer the question in a reliable way. We also add some additional time to our assumptions so that we rather accept too many exclusions than too few. Since we can analyse the issue with several types of statistical data from different sources, we believe that it is possible to provide a credible answer to the audit question despite the limitations described above.

⁶⁶ See for example OECD, *PISA 2018 Results*, 2019; OECD, *PISA 2018 Technical Report*, 2018; OECD, *PISA 2018 Technical Standards*, 2015.

4.2 Exclusions of newly arrived students in the 2018 PISA survey

To analyse the proportion of newly arrived students who could potentially be excluded from the PISA survey in 2018, we proceed as follows. With the help of the student register, we have mapped out how the student base in the schools that participated in PISA in 2018 looked regarding newly arrived students. A newly arrived secondary school student is defined in the NAE's statistics as a student who has immigrated in the past four years. The crucial criterion for a student to be excluded from the PISA survey due to limited language proficiency is that the student has had less than one year of tuition in Swedish. Thus, it is not enough to be newly arrived according to the statistical definition. We have calculated how many students can potentially be excluded under certain assumptions.

Information about population registration, immigration year and school start

To calculate which students could potentially be excluded from PISA in 2018, we have data on the immigration year and the month of immigration for a majority of the newly arrived students. The data is based on the population registration date. For the whole age group born in 2002 (the cohort who sat PISA in 2018) who were granted a residence permit in 2017, about half were granted it on grounds of asylum and about half were granted it as a relative of someone who had been granted a residence permit.⁶⁷

When a person applies for a residence permit as a relative of someone with grounds for asylum, the applicant should not normally be in Sweden. We do not know exactly how the grounds for residence permits were distributed in this group of students. We make an assumption that the distribution is the same as for the whole country, that is, almost half of the students were asylum seekers.

We also assume that applicants who are relatives of residence-permit holders and quota refugees were not in the country before the population registration date. Since it may take a month for the municipality to arrange a school place, and a screening is sometimes necessary to investigate before the student can start school, we have assumed that all those registered as relative immigrants from December 2016 can be excluded from the 2018 PISA survey.

The length of time it takes for asylum seekers to obtain a residence permit varies. For the individuals born in 2002 who were granted asylum in 2017, the average processing time at the Swedish Migration Agency was approximately 19 months.⁶⁸ We have therefore assumed that an asylum seeker student arrived in Sweden 19 months before the population registration date.

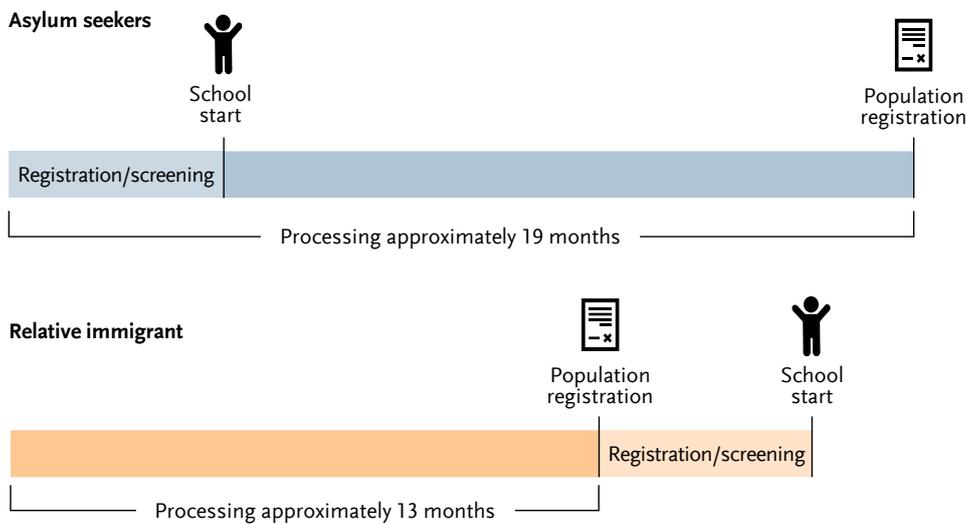
Since the receiving municipality has one month to enrol newly arrived students at school and up to two months to screen them, we assume that a student must have been in Sweden for more than 15 months to be included in the PISA survey. We assume that the students granted asylum in 2017 cannot be excluded due to the

⁶⁷ Email from the Swedish Migration Agency, 11 December 2020.

⁶⁸ Ibid.

language criterion, as on average they have been in the country for 19 months before that. We allow students who have received a residence permit as quota refugees to be excluded, but we assume that other child asylum seekers go to Swedish school.⁶⁹ We assume that students who have received a residence permit as a relative during 2017 can be excluded. We also assume that students who have received a residence permit as a relative in December 2016 can be excluded. How we envision the process towards starting school for different types of newly arrived students is illustrated in figure 8.

Figure 8 Illustration of the process before school start for newly arrived students



Source: Swedish NAO.

There were also over 300 students in the schools concerned who had no serial number (personal identity number). They are mainly students who have not been granted a residence permit yet, but they may also be undocumented migrants or students whose residence permit application has been rejected. Since we do not know enough about these students, we allow students without serial numbers to be excluded but assume that some of them were granted asylum in the last months of 2017. We also add a number that should have been granted a residence permit as a relative immigrant after October 2017 and can therefore be excluded.⁷⁰

⁶⁹ All children living in Sweden have the right to attend Swedish school and, as a rule, the children are registered for school as soon as they arrive in Sweden.

⁷⁰ On average, 20 students per month were registered in the population register in 2017. We assume that the figure was 20 students per month in October-December 2017 as well. We assume that 26 students were granted asylum and remove them from the group without serial numbers. We assume that 34 students have been granted a residence permit on other grounds and have therefore added them to the total number of students.

4.3 Calculations based on the student register and immigration year

Based on the above assumptions, we conclude that 2.5 per cent of the students at the selected schools could be excluded due to the language criterion. This is an increase of 0.5 percentage points compared with the number excluded due to the language criterion in connection with PISA 2015. The calculation is made for all students at the schools selected for PISA 2018 and thus not on the sample of 37 students per school selected for the survey. Since the sample of the 37 students is random, there is nothing to suggest that this would distort our calculations.⁷¹

We have also made a calculation where we allow exclusion of all students in the selected schools whose immigration year is 2017, plus students without serial numbers and a certain adjustment for the period October to December. In that case the possible exclusion rate is 3 per cent. When we do the corresponding calculation for the whole country, we get an exclusion rate of just under 3 per cent. The corresponding calculation for 2015 is 2.3 per cent – based on students born in 1999 and with the immigration year 2014, plus students without serial numbers. The figure for 2015 is well in line with the actual exclusions of 2015, which were 2 per cent. The different calculations are summarised in table 2.

Table 2 Calculations of potential exclusion rate due to OECD language criterion based on different assumptions

	(1) The Swedish NAO's preferred calculation	(2) Assumption that all students in school sample with immigration year 2017 can be excluded	(3) Calculation as (2) but on all students throughout Sweden	(4) Calculation as (3) but for students in PISA 2015	(5) Actual exclusions due to the language criterion of PISA 2015
Exclusion rate	2.5 %	3.0 %	3.0 %	2.3 %	2.0 %

Source: Swedish NAO's calculations based on statistics from the Swedish Migration Agency and the NAE.

Our figures, based on data on actual students at school, indicate some increase in students that could potentially be excluded in PISA 2018. At the same time, it is important to remember that according to statistics from the Migration Agency, there were no more asylum seekers just before PISA 2018 than in the years before PISA 2015 and marginal differences in terms of residence permits granted. This indicates that there should be no major increase in the exclusion rate. It is also possible that a larger proportion of the individuals without serial numbers that we exclude have actually been in Sweden for a longer time.

⁷¹ This calculation is based on the population left after the school exclusions have been made. If students in excluded schools are also taken into account, the proportion would be marginally lower.

4.4 Analysis of the PISA survey's individual data

To further examine whether newly arrived immigrants can explain the increase in exclusions for Sweden in the 2018 PISA survey, we investigate data from the questionnaire with background information that students who sit the PISA survey fill out. One of the questions that the students answer is how old they were when they arrived in the country where they sat the test.

By studying the proportion of pupils aged 12 or 13 when they came to the country, we can get an indication of how the refugee wave has affected the proportion of exclusions. Since students are 15 years old when they do the tests, most students arriving at the age of 14 can probably be excluded due to limited language proficiency. We compare the proportion who arrived as 12 or 13-year-olds for the 2015 and 2018 surveys and the comparison is also made for Denmark and Germany. Germany was the European country that after Sweden received the most refugees in the years around 2015-2016.⁷² Students who came to the country they now live in as 12 or 13-year-olds have usually been in the country too long to be excluded due to the language criterion. Since Sweden received more migrants per capita than other European countries during the period 2014-2017, it is reasonable to believe that the proportion should have increased more in Sweden than in other countries. It should be noted that the PISA survey is a sample survey and that small groups of students are tested per country. The analysis should therefore be interpreted with great caution.

For Sweden, this analysis shows that the proportion of students sitting the test aged 12 or 13 when they came to Sweden increased by around 80 per cent between PISA 2015 and 2018. In the 2015 survey, 1.2 per cent of all students who sat the test came to Sweden when they were 12 or 13 years old. In 2018, this figure was 2.2 per cent.⁷³

When we study Germany and Denmark, which also received many refugees during this period, the analysis shows a corresponding increase of just under 270 per cent for Germany and just over 110 per cent for Denmark. Sweden's share of students aged 12 or 13 when they came to Sweden does not increase as much as in these countries, which may indicate that Sweden excluded a larger proportion of these students.

⁷² In Germany, schooling for new arrivals is organised in a similar way as in Sweden. There are introductory classes, but not always. An estimated 60 per cent of newly arrived 14-year-olds are in introductory class – 22 per cent part-time, and 38 per cent full-time. The instruction takes place in German, and the students are allowed to attend for no more than two years. The big difference is that newly arrived pupils in Germany are not entitled to native language tuition. See Gambaro et al., "Integration of Refugee Children and Adolescents In and Out of School", 2020.

⁷³ The results have been weighted using the student weightings in the PISA survey.

Of the more than 5,000 students who sat the exams in March 2018, 120 students had moved to Sweden as 12- or 13-year-olds. These students had results in the PISA survey, which on average were between the 10th and 20th percentile of the distribution of the Swedish students' results.⁷⁴ In Annex 2, we calculate how the Swedish PISA results from 2018 would have been affected if the students who did not sit the test had participated.

4.5 The Swedish NAO's opinion

The Swedish NAO's opinion is that too many students were excluded in connection with the PISA survey in 2018. Based on the statistics available for participating schools, we can see that the proportion of students who had recently arrived in Sweden was not much higher compared to 2015. Our calculations suggest that the increase in the percentage of students excluded due to the language criterion should have been about half a percentage point between the surveys in 2015 and 2018.

In several situations, the NAE has argued that it is more important to look at how representative participation in the 2018 PISA survey was, instead of focusing on the proportion of excluded students.⁷⁵ According to the NAE, the proportion of students with foreign backgrounds was 9.9 per cent in the PISA survey in 2018, compared with the share of the total target population, which according to register data was 12.3 per cent. A possible underestimation of students with foreign backgrounds is estimated as 2.5 percentage points, but the same underestimation was found in the 2015 PISA survey (2.9 percentage points).⁷⁶ According to the Swedish NAO, this is not a relevant comparison since this student group may have been in Sweden since before they started school. That the representativeness for students with foreign backgrounds is unchanged does not say anything about whether too many student exclusions have been made.

We also note that the most widely used measure of the coverage ratio, index 3, does not consider non-response, which of course has a major impact on the representativeness of the results. Our assessment is that a better measure of the coverage, not necessarily representativeness, is the index we presented in chapter 2. It takes into account everything that means that participation is not 100 per cent, such as non-response, exclusions, replacement schools, etc. With this measure, Sweden's coverage ratio is only 73 per cent.

⁷⁴ This estimate of the performance level for these students is, of course, uncertain because it only refers to a small number of students. However, we can note that the results for this group of students are at approximately the same level in Norway, Germany, Denmark and Finland.

⁷⁵ National Agency for Education, "PISA 2018: Undersökningens syfte, genomförande och representativitet", retrieved 30 January 2020.

⁷⁶ Ibid.

5 Insufficient follow-up of exclusions

In this chapter we answer the question of whether the NAE provided clear and comprehensive instructions and relevant support on exclusions and non-response to selected schools. We also deal with the question of whether the NAE has effective quality assurance and follow-up of the schools' implementation of the PISA surveys in terms of exclusion and non-response. In summary, our findings are as follows:

- The NAE held appreciated information meetings and offered support. Criteria for exclusions were discussed at the information meetings. Despite this, the school coordinators have understood and applied the criteria in different ways – some erroneously.
- The NAE carried out the quality assurance elements required by the OECD, but little has been done to follow up on how school coordinators perceived the criteria and how they have actually excluded students.
- The NAE's letter to parents/custodians strongly emphasises voluntary participation in the PISA survey, which may have increased the proportion of parents/custodians who do not allow their children to participate.

5.1 The National Agency for Education's information and support to the school coordinators

In the autumn of 2017, the NAE sent out a letter to all the principals of the selected schools. The letter contained information that the school had been selected to participate in the PISA survey, what PISA is, and that the principal was to appoint a school coordinator and IT officer.⁷⁷ In connection with the letter, a brief information folder was also sent with a description of how the PISA survey is carried out and what tasks the school coordinator is expected to carry out.⁷⁸

5.1.1 The National Agency for Education's information on exclusions

At the beginning of the spring term 2018, the NAE called the selected school coordinators to information meetings. Prior to the meetings, the NAE sent out a manual to the school coordinators with instructions on how the survey would be conducted at the school. The manual contained information about the purpose of the PISA survey, the role of the school coordinator and step-by-step descriptions of the school coordinator's tasks and descriptions of the protocols and documents that the school coordinator would deal with. The manual also contains

⁷⁷ National Agency for Education, *Brev till utvalda skolenheter*, 2017.

⁷⁸ National Agency for Education, *Så här går PISA till – en sammanfattande beskrivning*, 2020.

information about how students in need of support should be identified and which students that can be excluded.

Prior to the information meeting, school coordinators were asked to list the students at the school corresponding to the survey's target group. In addition, the school coordinator would make a note of the students who for some reason needed support in their school education. Just before the school coordinator meeting, the NAE sent out a list to the schools of which 37 students had been selected to participate in the survey. After the school coordinators had received the sample, they decided on which students would be excluded in accordance with the OECD criteria.⁷⁹

The NAE held eight information meetings in Stockholm, Gothenburg, and Malmö. According to the NAE, almost all school coordinators came to the meetings.⁸⁰ For those who could not participate, the training was given by telephone, but all school coordinators were not reached, and some had to manage with written information.⁸¹ The meetings were full day meetings and included a background to the PISA survey, what is being tested and how the results can be used, information about other international studies and practical information about the implementation of the PISA survey.

According to the NAE, an important part of the information meetings was to point out that the PISA survey should be inclusive and the importance of all pupils participating. The NAE went through the criteria for exclusion of students and a discussion often followed. According to the NAE, the most common discussion was about assessing which pupils could be excluded due to cognitive disabilities. The NAE also received many calls from the school coordinators about this student group in connection with determining the exclusions.⁸²

Discussions about the OECD criteria for exclusion of students also included newly arrived students. According to the NAE, it was a matter of many schools having newly arrived students who had been in the school for less than a year, but also newly arrived students who had attended school for more than a year but still could not read or write in Swedish. Some school coordinators were also unsure of how long some newly arrived students had attended school in Sweden, as some students had moved between regions and schools. The NAE urged the school coordinators to exclude only students who had been taught Swedish for less than a year and had limited proficiency in Swedish and whose native language was not Swedish. The school coordinators who were unsure of how long a student had

⁷⁹ National Agency for Education, *Info om hur urvalet görs Pisa*, 2019, p. 1.

⁸⁰ Ibid.

⁸¹ Interviews with school coordinators.

⁸² National Agency for Education, *Info om hur urvalet görs Pisa*, 2019, p. 3.

attended school in Sweden were asked to consider the time the student had attended the current school.⁸³

Below are two examples from the manual and whether the students can be excluded:⁸⁴

Although Roy Zastrow’s experience of Swedish is limited, he has been taught in Swedish for over a year and therefore does not meet PISA’s criteria for exclusion due to inadequate language proficiency. Therefore, the “Excl” column is left empty and Roy Zastrow is considered to be able to participate in the test.

According to a statement of opinion from a professional expert, Anna Radlov has impaired cognitive ability and receives code “4” in the column “Support”. She does not participate in other similar tests. Therefore, she will not participate in the PISA test and code “3” is noted in the “Excl” column.

The manual also emphasised the importance of the school coordinators following the procedures to ensure that the PISA survey is carried out in the same way in all participating countries. If the procedures are not followed, it can lead to the results being unreliable.⁸⁵

Furthermore, the school coordinators were informed that many students in need of support could probably be included in the PISA survey without the help they would otherwise receive in the classroom or in connection with other tests. According to the NAE, it was enough for the student to participate in a part of the test in order for the results to be used. If the school coordinator was unsure whether a student should be excluded, they were asked to contact the NAE for consultation.⁸⁶

5.1.2 The National Agency for Education’s work with non-response

The proportion of selected students who did not show up on the test day increased by five percentage points between 2018 and 2015. There may be several reasons why students do not come to the test. They could be ill. They may not be allowed by their parents/custodians. They may not want to. They may be travelling. There are various measures that can be taken to increase attendance at the test. Schools can, for example:

⁸³ National Agency for Education, *Info om hur urvalet görs Pisa*, 2019, p. 3.

⁸⁴ National Agency for Education, *PISA 2018 Huvudstudie – manual till skolsamordnare*, 2018, p. 15.

⁸⁵ *Ibid.*, p. 2.

⁸⁶ National Agency for Education, *Info om hur urvalet görs Pisa*, 2019, p. 3.

- have inspiring school coordinators
- emphasise the importance of participation
- use coffee and cake/pizza as an incentive
- facilitate participation, for example by not arranging the tests far away or on a study day
- be strict with follow-up sessions.

At the information meetings held for the school coordinators, the NAE discussed how they could work to motivate students to participate in the PISA survey. Among other things, a film that could be used for the purpose was shown and brochures to be distributed to the students were handed out. They also presented information about the coffee money that the schools can use at the time of the test. In connection with the PISA survey, a school asked the NAE to come out and motivate the students for the test, which they did.⁸⁷

Since Sweden, in connection with the 2018 survey, connected the personal identity numbers of the students who sat the tests with the results, the information that went out to the parents/custodians was changed, in accordance with a requirement from Statistics Sweden.⁸⁸ The letter of 2015 emphasised the importance of the student's participation. In the letter that the NAE sent out in 2018 it stated instead that sitting the test was voluntary and the parents/custodians were urged to call the contact persons at the NAE if they did not want their children to participate.

The study is voluntary and as parent/custodian you have the right to receive information that your child has been selected for PISA 2018. Students will take the test at their school during school hours and answer the questionnaire in March 2018. If you do not want your child to participate in the study, please contact one of the contact persons at the NAE, see below.

The guardians were encouraged to make direct contact with the NAE to relieve the schools, but also because the NAE was better equipped to explain what the PISA survey was about and the importance of students' participation. In some cases where the parents/custodians called to say that their children would not participate, the NAE managed to change their decision.⁸⁹ However, the proportion of students who were not allowed by their parents/custodians to sit the test increased sharply in 2018 and accounted for 2 percentage points of the non-response.⁹⁰

⁸⁷ Written reply from the NAE, 17 March 2021.

⁸⁸ Written reply from the NAE, 27 October 2020.

⁸⁹ Written reply from the NAE, 17 March 2021.

⁹⁰ In 2015 there were 28 students, in 2018 there were 161 students.

The other Nordic countries did not emphasise that participation was voluntary, though it may be understood indirectly. For example, the Finnish letter said:

We would also like to thank you for your child's contribution to the PISA survey. It is important for the credibility of the survey that as many of the selected students as possible participate. We believe that the results will again do credit to the young people in Finland and the Finnish school system.

Although it is voluntary to participate in the PISA survey, this can be presented in a variety of ways, as the various Nordic letters illustrate. There are also countries that have chosen to make the participation mandatory for selected students. One example is Germany where it is mandatory for the selected students of federal schools to participate in the PISA survey in most states.⁹¹

A school coordinator we interviewed told us that at their school an edited letter was sent to the parents/custodians, where students who wanted to participate were urged to register for the survey. Students who did not report interest were not contacted again. At this school, the students could thus choose whether they wanted to participate, and parents/custodians did not need to notify that they did not want their children to participate. The students who did not sign up for the test were registered as non-response.⁹²

The OECD had as a requirement for Sweden's results to be approved that at least 76 per cent of the selected students, after exclusions, also sat the tests.⁹³ The NAE had as a principle that schools with less than 80 per cent participation in the individual school would have a follow-up session (i.e. an additional test day for students who were absent on the first occasion), but if it was difficult to arrange exceptions were sometimes allowed. The focus was on the total non-response not exceeding 15 per cent.⁹⁴ In connection with the PISA Survey of 2018, 23 schools had more than 20 per cent non-response and 18 schools arranged follow-up sessions.

A further measure to reduce non-response may be to avoid having national tests during the same time period as the PISA survey is carried out. There are three PISA periods, two in the spring and one in the autumn. Sweden conducts the survey during the first period and it is not possible to change the test period.⁹⁵ In the spring of 2018, students in year nine sat a total of nine national tests, two in

⁹¹ Email from national project managers for the PISA survey in Germany, 14 January 2021.

⁹² This was a school with fewer than 37 students in the target group, thus no selection was made.

⁹³ Written reply from the NAE, 15 March 2021.

⁹⁴ Written reply from the NAE, 11 December 2020.

⁹⁵ Written reply from the NAE, 15 March 2021.

the same two-week period as the PISA tests. No other Nordic countries have national tests in the same period as the PISA survey.⁹⁶

5.2 The National Agency for Education's quality assurance and follow-up of exclusions and non-response

Before each PISA test, a pre-study is carried out the year before. The purpose is to test and quality assure all elements, practical and technical, as well as the materials used, such as information to schools, test and questionnaire questions. The pre-study is an important part of the quality assurance of the main study.⁹⁷ In connection with the pre-study in 2017, the NAE noted that the exclusions were significantly higher than in previous years. A total of 9 per cent of the students were excluded from the survey in the pre-study. This prompted the project team to call the schools which had excluded students to ensure that the exclusions had been done correctly. According to the NAE, there were no signs of incorrect exclusions during these calls. Many exclusions were instead about students who had received less than a year of tuition in Swedish and, in some cases, students who were illiterate.⁹⁸ There is no written documentation of the NAE's work to follow up the exclusions in the pre-study.⁹⁹ The NAE informed the OECD that they expected high exclusion rates in connection with the main study in 2018, due to the high influx of refugees during the period.¹⁰⁰

The implementation of the PISA Survey is governed and controlled by the OECD and the NAE has detailed manuals to relate to.¹⁰¹ The NAE did not deem it necessary to do any further quality assurance or follow-up of exclusions prior to the main study. In connection with the pre-study, the project group at the NAE had a longer communication with the contractor for the study, where they discussed the reasons for the high number of exclusions and what this could mean for the main study. The contractor suggested at one point that a maximum number of permitted exclusions per school be introduced, but we cannot see that this has been followed up anywhere.¹⁰²

A complicating circumstance as regards the follow-up of exclusions is the interpretation of the Personal Data Act made by the NAE's legal department in 2016. As of the pre-study in 2017, the exclusions are reported jointly in the 'Other' category, instead of separately for disabilities and language proficiency limitations.

⁹⁶ Email correspondence with the Nordic national project coordinators.

⁹⁷ Written reply from the National Agency for Education, 27 October 2020.

⁹⁸ National Agency for Education, *Info om hur urvalet görs Pisa*, 2019, p. 3.

⁹⁹ Written reply from the NAE, 17 March 2021.

¹⁰⁰ Email from the NAE with written questions and replies from the Swedish NAO prior to the meeting on 11 December 2020.

¹⁰¹ Written reply from the NAE, 27 October 2020.

¹⁰² Email correspondence NAE – Westat, 16 March 2017.

The NAE considers that it lacks a legal basis to process ‘sensitive personal data’ under the previous Personal Data Act.¹⁰³ However, the scope of an agency to process such necessary personal data on the basis of, for example, statistical purposes or important public interest has been clarified in connection with the introduction of the EU General Data Protection Regulation. In connection with this, it was clarified that, for example, the organisation and conduct of education constitute such important public interest.¹⁰⁴ Despite this, the NAE has not changed its position on the issue.¹⁰⁵ It is not up to the Swedish NAO to take any legal position in this regard. However, we note that the NAE has not raised the issue with the Government Offices to enable more functional reporting of the exclusions through, for example, a statutory amendment. It should be added that the legislator has already authorised the Government to issue additional regulations regarding such processing of sensitive data as is necessary in view of an important public interest.¹⁰⁶

5.3 Mid Sweden University’s implementation of the PISA survey

The Mid Sweden University, which was responsible for the implementation of the PISA survey until 2015, worked in some respects differently from the NAE. They carried out all the steps required by the OECD, but also took some further steps to get the highest participation possible.

After Mid Sweden University received lists of which schools were selected to participate in the survey, all the principals of the selected schools were contacted. After that, project managers from Mid Sweden University went on a tour and gathered all the school principals at meetings around the country, in four different cities. They brought with them a researcher who used statistics from the PISA survey in their research. Mid Sweden University justified these tours by stating that it is important to get the principals involved, otherwise it is difficult to make the implementation work well in schools. One year, they did not go on a tour in connection with the pre-study, but they then noticed that the exclusions rose, and therefore reintroduced it for the main study.¹⁰⁷

The meetings spanned a whole day, where the morning was used for a review of research related to the PISA survey together with the participating researcher. They talked about what the PISA survey is and how its results can be used. Heavy

¹⁰³ Personal Data Act (1998:204) which since 25 May 2018 has been replaced by the EU General Data Protection Regulation 2016/679 (GDPR).

¹⁰⁴ Govt. Bill 2017/18:218, Committee Report 2017/18:UbU28, Riksdag Comm. 2017/18:431.

¹⁰⁵ Email from the NAE, 19 January 2021.

¹⁰⁶ Chapter 3, Section 4 of the Act on supplementary provisions to the EU General Data Protection Regulation (2018:218).

¹⁰⁷ Interview with Mid Sweden University 6 November 2020 and 21 January 2021.

focus was on raising the awareness of the principals of how important it is for selection and implementation to be correct. Mid Sweden University argued that the PISA survey ultimately benefits the principals and their school activities because research based on correct PISA results should identify the problems that exist in schools and could thus lead to appropriate improvement measures. The afternoon was devoted to more practical details on the work to make correct exclusions and reduce non-response. In addition, they raised the importance of selecting a suitable school coordinator and it was emphasised that this should be a person who can inspire and motivate students and teachers in the work as well as inspiring confidence. The NAE also participated in these meetings.

Later, Mid Sweden University went on another tour to meet the selected school coordinators. At that time they did not bring any researchers along, but presented how the PISA survey can be used in research. The conversations about exclusions were perceived as tough as these may be sensitive issues to talk about when it comes to students with different disabilities. Mid Sweden University talked to the school coordinators about the importance of encouraging students to participate and discussed different ways to motivate them.

According to Mid Sweden University, it was a deliberate strategy to sell the PISA survey to the principals, to raise awareness of the “seriousness and intention” in connection with the survey. The meetings were considered by Mid Sweden University to contribute to Sweden not only having a high level of participation but also that schools and students carried out the survey somewhat more seriously.¹⁰⁸

Mid Sweden University made it a rule that follow-up sessions should be held if five or more students were absent from the test, but urged schools to have follow-ups even when three or more students were absent and also consider it for individual students.¹⁰⁹

Since the exclusions had increased slightly from year to year, Mid Sweden University asked the school coordinators to send in the student protocols for the main study in 2015, after they marked which of the students selected to sit the tests would be excluded for various reasons. According to Mid Sweden University, this resulted in a lot of phone calls with the school coordinators before the lists were to be submitted, but not that they needed to question the exclusions that were then made. The collection of the lists gave them a better overview of the number of students that the schools intended to exclude and that they could have discovered in advance the schools that might possibly exclude too many students.

¹⁰⁸ Fredriksson, Karlsson and Pettersson, *PISA under 15 år – resultat och trender*, 2018, p.39.

¹⁰⁹ Email correspondence with Mid Sweden University, 22 January 2021.

5.4 School coordinators' application of the criteria

The overall picture from our interviews with the school coordinators is that they have experienced the NAE's information meetings as good, clear and informative. Despite this, the interviews show that the school coordinators understood the information given at the meeting in different ways.

About half of the school coordinators we interviewed had understood the information correctly, i.e. in accordance with OECD criteria. The school coordinators who were as strict as the rules say do not seem to have experienced this as particularly challenging, for example, to include students who, despite more than a year of schooling in Sweden, do not have good proficiency in Swedish. In general, the school coordinators we interviewed say that the students who sat the tests experienced it as positive. The students were proud to contribute to something greater that can affect the image of Swedish schools, and ultimately investments and measures taken in schools. In some of our conversations we heard about students with quite a lot of special needs, both for language reasons as well as various diagnoses, who actually enjoyed participating.

Some school coordinators have perceived that the exclusions of the students in general is a matter of assessment by the school coordinator, possibly together with other teachers. Among the school coordinators who misunderstood the criteria concerning limited language proficiency, two variants dominate:

- Those who understood that newly arrived students may be excluded, but refer to the NAE's definition of new arrivals for statistical purposes, i.e. students who have been up to four years in Sweden.
- Those who thought that they themselves should assess the student's language proficiency, regardless of the time that the student had been taught in Swedish, and on that basis determine whether the student should sit the test.

As for students who were excluded due to various disabilities, the school coordinators we spoke to in general found it more difficult to remember what they did. In several cases, there were students who receive their education in compulsory school but study according to the syllabus for compulsory school for students with learning disabilities and should therefore be excluded under the OECD rules. Often a special needs teacher or special needs educator was involved in the decisions, but sometimes it was the school coordinator who decided who should participate or not. In some schools whose school coordinators we interviewed, many students with emotional disabilities were excluded. As for students with dyslexia, some school coordinators excluded such students while others allowed them to participate in the test.

Some school coordinators have obviously excluded students incorrectly. For example, some school coordinators excluded school refusals and some excluded students who might be expected to find it difficult to sit the test. One also excluded students whose parents/custodians did not allow the student to sit the test even though these students should be registered as non-response.

With some occasional exceptions, the school coordinators we interviewed only had contact with the NAE during the actual meeting as regards exclusions. Some had contact with the NAE in addition to the meeting, but then it was often about practical and technical issues, for example linked to loans of computers. Thus, we cannot comment on the additional support offered by the NAE if necessary. Some school coordinators passed on the task of exclusions to teachers and teams and were not involved in the process themselves.

Many school coordinators arranged activities and meetings at the schools to inspire and motivate the selected students to sit the test. Not all of them did this, however, and some schools arranged the tests in a way that rather counteracted a high level of participation. For example, one school with a high non-response rate, conducted the tests at premises situated far away from their own school, which required a 20-minute walk for the selected students. The interviewed school coordinators feel that the NAE went through how to inspire students to sit the tests at the information meetings. Many school coordinators also emphasise the importance of incentives in the form of, for example, pizza or coffee and cake for the students who come to sit the tests.

Only one of the interviewed school coordinators stated that it sometimes can be difficult to know how long a specific student has been in a Swedish school.

Of the school coordinators we asked, almost half feel that it is a problem that the PISA survey is carried out during the same period as there are a lot of national tests. When perceived as a problem, it is a contributing cause of high absence from the tests. It is often more high-performing students who are absent for that reason.

5.5 The Swedish NAO's opinion

Our overall opinion after the interviews we conducted with 32 school coordinators is that although the information meetings were perceived as good, clear and informative, it is obvious that the rules for exclusion of students have been understood in many different ways. One principal put it well when she said that at the meeting it sounded clear and simple, but when they sat with the lists, there were still lots of questions and difficulties in interpretation. In some cases, obviously incorrect decisions were made, for example when school coordinators excluded students because they were expected not to show up anyhow. Or when they were based on the four-year limit for new arrivals. Sometimes there are more

dubious cases, such as when it comes to the students excluded because school coordinators considered that they could not sit still that long or could not concentrate for the time required. Since we have not interviewed all school coordinators, we make no claim to have a complete picture of how all school coordinators understood the information they received from the NAE.

If the NAE had acted as discussed with the contractor in connection with the pre-study, i.e. introduced a maximum ceiling for the number of excluded students per school, the high figures might have been avoided. We do not know why this idea was not put into practice. It is also difficult to understand why the NAE, based on the exclusions in the pre-study, assumed that there would be equally high exclusions in 2018. The large group of new arrivals came at the end of 2015 and since then the number of new arrivals has decreased steadily.

We see two main differences in the implementation work between the NAE and Mid Sweden University that we believe are of importance. Firstly, Mid Sweden University actively worked with the principals regardless of whether they had the role of school coordinator or not, to emphasise the importance of the right sample selection and participation being as high as possible. They emphasised how important it was for the right person to be chosen as a school coordinator. Even though the information provided by both the NAE and Mid Sweden University was based on the same manuals, we consider it particularly helpful for the implementation to work actively with all the principals in order for them to understand the importance of getting students to participate in the survey. Our assessment is that Mid Sweden University emphasised the choice of school coordinators more than the NAE. Mid Sweden University clarified the importance of choosing a person with the qualities needed for achieving a high level of participation. Secondly, for the main study in the 2015 PISA survey, Mid Sweden University required submission of student protocols before the test took place. If the exclusions had been as high as in 2018, there would have been time to question this before the tests were carried out. The NAE did not take any of these measures in connection with the main study in 2018.

We also note a certain difference as regards follow-up sessions at schools. Mid Sweden University urged the schools to hold such sessions in the event of a non-response of three students, the NAE in the event of non-response of 20 per cent or more. The latter differs based on the number of students who were to sit the test.

We see no reason to question that the NAE carried out all the steps required by the OECD. However, we cannot see that they have taken any self-initiated measures to get as high a participation rate as possible nor analysed the low participation level to determine what was behind it.

6 Doubts about Sweden's participation in the PISA survey have not been investigated properly

In this chapter, we answer the question of whether the Government, the Government Offices and the NAE have properly investigated the doubts concerning participation in the 2018 PISA survey. We find, among other things, that:

- The Government Offices refer all questions regarding the OECD assignment to the NAE
- the report produced by the OECD is based on a number of incorrect assumptions
- neither the Government nor the NAE noticed that the OECD misunderstood how education for newly arrived immigrants works in Sweden.

6.1 The OECD was commissioned to review Sweden's data a second time

When the results of the 2018 PISA survey were published in December 2019, the high exclusion numbers for Sweden were questioned by both media and researchers. The NAE assured that they had done everything correctly and that the high exclusion rate was a consequence of the large refugee flows in preceding years. The Government referred to both the NAE and the OECD as having approved and explained the figures. The State Secretary of the Ministry of Education and Research wrote an opinion piece in *Dagens Arena* on 10 December calling the questioning of the Swedish figures "conspiracy theories".¹¹⁰

When the figures were again questioned, in connection with articles in *Expressen* in June 2020, representatives of the Government, after consultation with the NAE, contacted the OECD to ask for a renewed and in-depth review of the Swedish statistics.¹¹¹ Since Sweden's exclusions were above the approved limit of 5 per cent, Sweden's figures had already been processed and approved by the OECD Adjudication Board.¹¹² It was the NAE that instructed the OECD and discussed form, content and remuneration. No instructions were given by the Ministry of Education and Research. However, according to the Ministry of Education and

¹¹⁰ Nilsson, "Konspirationsteorier stjäl fokus från PISA-framgång", 10 December 2019.

¹¹¹ Hellberg, "Anna Ekström begär ny granskning av resultaten", 3 June 2020; OECD, *A review of the PISA 2018 Technical Standards in regard to exclusion due to insufficient language experience*, 2020, p. 4; memorandum of 9 June 2020, Reference material for a meeting of the Riksdag Committee on Education.

¹¹² OECD, *PISA 2018 Main Study Data Adjudication Report*, 2019.

Research, a dialogue was conducted between the OECD, the NAE and representatives from the Ministry concerning the 2018 PISA survey.¹¹³

In June 2020 representatives from both the Government and the NAE maintain that the Swedish PISA survey in 2018 has been carried out in accordance with current rules and that the OECD has reviewed and approved the approach and results. The increased rate of exclusion is explained by the migration flows arising from the refugee crisis.¹¹⁴ In a written reply in the Riksdag, the Minister for Education writes that the NAE is responsible for the PISA survey and that the OECD has previously reviewed and approved the results. The reply also states that the Government assumes that the official statistics of Swedish agencies and the OECD are correct and that the Government have not received any information that suggests incorrect exclusions. Such a large study as the PISA survey must be reliable and the Government sees no reason to question official statistics from agencies and the OECD. To ensure that there is no doubt, it is welcomed that the OECD will review the statistics again.¹¹⁵

On at least two occasions since the PISA results were presented in December 2019, officials at the Ministry of Education and Research have produced memorandums in which they state that the high exclusion rates are problematic and cannot be fully explained by an increased influx of newly arrived students during the relevant period of time. The officials also point out that the OECD does not seem to have understood how education for newly arrived students works in Sweden. The first memorandum is dated only a few days after the publication of the 2018 PISA survey and the second in connection with the OECD review of the results published in September 2020.¹¹⁶ As far as we know, neither these memorandums, nor their content, have been discussed with the NAE.

6.2 Lack of transparency from the OECD regarding the PISA survey

The following reasons have been put forward for instructing the OECD to make a second review of Sweden's exclusions from PISA 2018:¹¹⁷

¹¹³ Email from the Ministry of Education and Research, 17 November 2020 and 22 January 2021.

¹¹⁴ Memorandum Ministry of Education and Research, 29 May 2020; memorandum Ministry of Education and Research 9 June 2020, Reference material for a meeting with the Riksdag Committee on Education.

¹¹⁵ Reply to written question 2019/20:1675 answered by Minister of Education Anna Ekström U2020/03951/S.

¹¹⁶ Memorandum Ministry of Education and Research, 4 December 2019; memorandum Ministry of Education and Research, 1 October 2020.

¹¹⁷ Memorandum Ministry of Education and Research, 9 June 2020; Reference material for a meeting with the Riksdag Committee on Education.

- The OECD is considered to have the expertise to conduct a proper review and it is in the organisation's interest to do it well.
- The OECD is considered to have the expertise concerning the countries' data collection, which could be useful if similar dilemmas existed in other countries.
- The OECD is considered appropriate to determine how Sweden's data collection and quality control compares to other participating countries.
- A national commission appointed by the Government would mean that resources are taken from other activities that need to be carried out within the school system.

Both the Government and the NAE repeatedly bring up the OECD's expertise in these matters and that it is in the OECD's interest that similar issues are properly investigated. However, there are several research articles questioning above all the OECD's transparency regarding the PISA survey, see Annex 3. In connection with our document studies, we have also found it difficult in some cases to understand the reasons behind the OECD's positions. One example is the approach of the OECD to approving different participant countries' data.¹¹⁸ In connection with PISA 2018, 16 countries had exclusion rates above the approved limit of 5 per cent (see section 2.2.3). From the OECD's documentation, it is not particularly easy to understand why the high numbers have been accepted. We have twice asked the OECD for explanations for countries' exclusions, but we have not received sufficient information to actually understand. Among other things, it is unclear why Israel's high exclusion figures are accepted. Apparently, it is because a number of boys' schools refuse to participate, but it is unclear why this is counted as exclusions and not non-response. For Norway, it is incorrectly stated that the high figures are due to more students with limited language proficiency when it is students with disabilities that increased. For Luxembourg, the exclusions swing between 4 and 8 per cent over a longer period of time without any explanation being given.

When it comes to Sweden's high exclusion figures in connection with the 2018 survey, we have tried to clarify what the Adjudication Board based its assessment on, i.e. that the high Swedish exclusion figures were due to the influx of refugees to Sweden in the years before PISA 2018. The NAE has not had any direct correspondence about this more than one email exchange with the contractor, in connection with the pre-study, where the agency writes that the refugee flows are most likely the explanation.¹¹⁹ The OECD in turn refers to communication with the contractor, and to the strong support for the hypothesis in available migration

¹¹⁸ The OECD has previously been criticised for lack of transparency with regard to the PISA survey. See for example Tienken and Mullen, *Education Policy Perils. Tackling the Tough Issues*, 2016, p. 121.

¹¹⁹ Email from the NAE, 1 February 2021.

statistics.¹²⁰ As we showed in Chapter 3, migration statistics show a larger inflow of asylum seekers before the PISA Survey 2015 and a similar inflow with regard to other residence permits granted.

When a country's data is not judged credible for any reason, the country receives an asterisk in the tables indicating that there are doubts as to how accurate the results are. On at least a few known occasions, it has been discovered that certain parts of the data collection have not been correct, but that the OECD has not highlighted the country's results with an asterisk. For example, Canada has repeatedly had problems with many schools choosing not to participate, which impairs the representativeness of the schools and students participating.¹²¹ Another example is the United Kingdom, which in the PISA survey of 2015 had an almost three percentage points higher exclusion rate than the previous round (from 5.4 to 8.2 per cent). The explanation is stated as an unintentional consequence of changes in the time when information about special needs was collected, which seems to have led to school coordinators marking more students for exclusion. As the cause was discovered and would be addressed for the next time, the OECD decided to approve the results, i.e. without any asterisk in the tables.¹²² The United Kingdom's exclusions returned to the level they were usually at in connection with the 2018 PISA survey.¹²³

6.3 The OECD's assignment was unclear and the result was not credible

According to the communication we have accessed between the NAE and the Ministry of Education and Research, as well as between the NAE and the OECD, the NAE and the OECD describe the assignment in different ways. There is no description of the assignment related to the payment for the assignment (EUR 20,000). The NAE has signed an "offer letter" where the payment is stated as a voluntary contribution to analysis of PISA data. There is nothing in either the offer letter or the invoicing documentation about the analysis concerning exclusions or Sweden's implementation of the PISA survey.¹²⁴

¹²⁰ Email from the OECD, 5 February 2021.

¹²¹ For more information, see Anders et al., "Is Canada really an education superpower? The impact of non-participation on results from PISA 2015", 2021.

¹²² OECD, *PISA 2015 Technical Report*, 2017, p. 273.

¹²³ Before and after 2015, the implementation was handled by the National Foundation for Educational Research (NFER), but for 2015 another organisation was responsible for the implementation. According to email correspondence with John Jerrim 12 January 2021.

¹²⁴ Offer letter 10 September 2020; invoice 12 October 2020.

According to a text message from the Director-General of the NAE to the State Secretary of the Ministry of Education and Research, the OECD is to describe the following in the report:¹²⁵

- the contacts with the schools
- observations from the review of participating schools
- whether follow-up of one or more individual schools was relevant
- how the process was carried out at schools in Sweden and how the exclusions were quality assured.

The OECD states in the report that it should include:¹²⁶

- an overview of target population and sample design in the PISA survey
- the exclusion criteria
- how a school sample frame is developed and how the national target population is determined
- response frequency standards
- the quality assurance process of the contractor and the OECD as well as the findings of the Adjudication Board.

Of the report's 55 paragraphs, seven are about Sweden. There is also a fact box where calculations are presented. The remaining text is taken from the OECD's manuals and reports and is at an overall level. What is mentioned about the Swedish quality assurance is that Sweden's national project manager (i.e. the NAE) has understood the rules for exclusions and that they, "had been applied correctly to the best of their knowledge".¹²⁷

The OECD delivered its report as agreed on 30 September 2020.¹²⁸ They conclude that the high exclusion rates are probably due to the high number of newly arrived students in the preceding years. However, we note that the conclusions of the report are based on incorrect assumptions, namely that:

- all newly arrived students attend a preparatory class
- students in preparatory class attend for two and a half years.

In addition, potential time in a preparatory class is not counted as tuition in Swedish. Based on these assumptions, the OECD compiles calculations for the whole country, using register data from the student register. In these calculations, no account is taken of the year of immigration, but students born in 2002 within the school system on 15 October in the respective year are divided into three

¹²⁵ Text messages 12 and 15 June 2020.

¹²⁶ OECD, *A review of the PISA 2018 Technical Standards in regard to exclusion due to insufficient language experience*, 2020.

¹²⁷ OECD, *A review of the PISA 2018 Technical Standards in regard to exclusion due to insufficient language experience*, 2020.

¹²⁸ Ibid.

categories: Swedish, Swedish-born with foreign background and foreign-born with foreign background. Those added to the last category each year are assumed to represent the number of foreign-born students with foreign background who started school during the year. The OECD assumes that all students born abroad with a foreign background, added to the student register after October 2014, may potentially be excluded due to the rules of exclusion based on limited language proficiency. Some of these students may have attended Swedish school for up to 3.5 years when the PISA survey was conducted in March 2018. The OECD's statistics are delivered and calculated by the NAE. Table 3 below was produced by the NAE and is reproduced in the OECD report.

The OECD has not itself requested access to original data, but nor can the NAE disclose microdata to the OECD due to existing regulations on statistics. Data can only be disclosed for research or statistical purposes if they are subject to confidentiality provisions. The NAE does not consider this to be the case for the OECD.¹²⁹ The OECD is also not assessed to have sufficient familiarity with and knowledge of Swedish conditions and data registers to be able to utilise the data should they receive it.¹³⁰

The Swedish NAO argue that the assumptions -mentioned above are incorrect (see Chapter 3 for a description of education for newly arrived students). Preparatory class is an organisational form and not a school form. Many newly arrived students do not attend a preparatory class. It is regulated by law that students are not allowed to attend preparatory classes for more than two years.¹³¹ As we have noted above, most of the students attend preparatory classes for a considerably shorter period than two years and the instruction in preparatory classes is in Swedish.

¹²⁹ Written reply from the NAE, 15 March 2021.

¹³⁰ Email from the NAE, 12 February 2021.

¹³¹ Chapter 3, Section 12 f of the Education Act.

Table 3 OECD's calculations on the number of students potentially excluded due to the language criterion – students born in 2002

October	2014	2015	2016	2017
Swedish students with at least one parent born in Sweden (1)	82 668	82 758	82 701	82 483
Born in Sweden with foreign background (2)	10 284	10 349	10 331	10 529
Foreign-born with foreign background (3)	10 137	11 911	14 482	15 975
Total	103 089	105 018	107 874	108 987
(3) who started Swedish school between Oct.2014 and Oct 2015		1 774 (11 911-10 137)		
(3) who started Swedish school between Oct.2015 and Oct. 2016			2 931 (14 482-11 911)	
(3) who started Swedish school between Oct.2016 and Oct. 2017				1 133 (15 975-14 482)
Total number of students				5 838

Source: OECD, *A review of the PISA 2018 Technical Standards in regard to exclusion due to insufficient language experience*, 2020.

Note: Figures in brackets added by the Swedish NAO.

The OECD adds together all foreign-born students with foreign background who started in Swedish school from October 2014 according to the student register. To this is added 189 students who are counted as having started after October 2017 and thus not included in the student register. Together this gives just over 6,000 students (1,774 + 2,931 + 1,133 + 189 = 6,027). The weighted number of students excluded due to limited language proficiency in PISA 2018 is about 7,500.¹³² Despite assumptions that in our opinion are too inclusive, the OECD does not reach the figure of 7,500 students in its calculations. However, the OECD's assessment is that it is close enough to be able to regard Sweden's data as reliable.

¹³² The figure is based on the assumption that the exclusions due to disability have not changed since 2015. The number is weighted to represent the entire target population of students.

6.3.1 Discussion of results

The Swedish NAO's assessment is that with the statistics that the OECD uses as a basis, only the students who started Swedish school after October 2016 should be excluded. These students may have had up to one year and four months of schooling before the PISA test (we have calculated potentially two months in 2016, two terms in 2017 and two months in 2018). The total for these students is $1,133 + 189 = 1,322$, which is only 1.2 per cent of the target population.

We can see two explanations for the low figure compared with our calculation in Chapter 4. It may be that a larger proportion of the students registered in the population register in 2017 actually started school much earlier than we assumed (i.e. before October 2016). Or it may be that many of the 4,705 students who were added between October 2014 and October 2016 had left Sweden at the time of the data collection in October 2017 (many were not granted residence permits), which means that a larger proportion than expected in the table had actually been added in 2017.

6.3.2 References in the OECD report

The list of references in the OECD's report consists of Expressen's article, some self-published manuals and reports, data from Sweden delivered by the NAE and a memorandum in Swedish about education for newly arrived immigrants in Sweden, written by the unit manager of the Unit for targeted measures for newly arrived immigrants' learning at the NAE.¹³³ In our opinion the memorandum correctly describes education for newly arrived students and judging from the questions we have seen in the email exchange the NAE correctly replied to all the questions sent by the OECD. However, we can see that the NAE in another email writes that a student can attend a Swedish school for three years before they have been taught in Swedish for one year.¹³⁴ This is astonishing and incorrect. It is important that the NAE ensures that the information they provide is correct. In the OECD report, time in preparatory class is not included in the period that a newly arrived student has been taught in Swedish. We have asked the OECD why this is so but have not received a clarifying answer. They reply that a student must have been taught in Swedish for one year. The OECD writes that this means that students who have attended a Swedish school and taken preparatory classes, such as Swedish as a second language, for up to two years before they are taught in Swedish can be excluded.¹³⁵ This indicates a misunderstanding, because Swedish as a second language is not a preparatory class, but a subject that a student can study throughout their compulsory school and upper secondary period, even if

¹³³ National Agency for Education, *Nyanlända elever i det svenska skolsystemet*, 2020.

¹³⁴ Email from the NAE to the OECD, 23 June 2020.

¹³⁵ Email from the OECD, 5 February 2021.

they are born in Sweden.¹³⁶ In addition, as we mentioned before: tuition in Swedish schools is given in Swedish.

6.3.3 OECD's views on the Swedish National Audit Office's opinion

The OECD has been given the opportunity to check the factual accuracy of the aspects of this audit that concern the OECD. After this, they have redesigned their calculations based on the fact that a student can only attend preparatory class for two years and not two and a half years as they previously calculated. This has thus not come to their attention until the Swedish NAO pointed it out almost half a year after the conclusions of their report were published on the NAE and the Government's websites. The revised calculations show that 5,300 students could potentially be excluded due to the language criterion in the 2018 survey, i.e. 2,200 fewer students than were excluded.¹³⁷ Despite this, their overall assessment does not change that the high exclusion rates can be explained by an increased number of newly arrived immigrants.

In its reply to the Swedish NAO, the OECD states that they have calculated how many students could potentially be excluded. Since there is no exact measure of how long a student needs before they can participate in regular Swedish teaching (we believe that the OECD by regular Swedish teaching refers to the subject Swedish instead of the subject Swedish as a second language) they use the maximum time in preparatory class as an approximation. They also write that even if students in preparatory class are taught in Swedish, they are not deemed to have sufficient Swedish knowledge to be able to participate in regular Swedish teaching.

6.4 The Swedish NAO's opinion

The Swedish NAO considers that neither the Government, the NAE nor the OECD have taken sufficient measures to find out if there were actual errors regarding participation in the 2018 PISA survey. The data from the student register we used in the audit were already available the first time the doubts regarding the exclusions came up. In December 2019, officials at the Ministry of Education and Research concluded that it could not be the language criterion that explains the high exclusion levels. We do not know how this memorandum was dealt with, but doubts do not seem to have been followed up because the Government continued to refer to the NAE's and OECD's assurances that the Swedish statistics were approved. The Government Offices refer to the NAE both regarding whether everything was done correctly and how and why the assignment was given to the OECD. Since the results of the PISA survey are used regularly, for example in the Budget Bill, the Government should have followed up

¹³⁶ Chapter 5, Section 14 of the Schools Ordinance (2011:185).

¹³⁷ The number is weighted to represent the entire target population of students.

thoroughly what actually happened. We note that the Ministry of Education and Research initially asked questions about the assignment and seems to have tried to ascertain that the report would answer existing questions.

The OECD should certainly have the expertise to make a correct assessment of the statistics, but they did not have any knowledge of the Swedish school system and how education for new arrivals works. Nor did they themselves have access to original data, but throughout asked the NAE to perform calculations for them. This has made it difficult to produce a credible and accurate report. Our assessment is that the first approval of Sweden's data, which was made by the Adjudication Board prior to the publication of the survey, was based on weak empirical data. According to the information we received from the OECD, the decision was based on an email exchange between the NAE and the Contractor in connection with the pre-study where the NAE writes that the refugee flows are a probable explanation.¹³⁸ We also consider it doubtful whether the OECD had sufficiently strong incentives to actually detect errors in data and thus revise its previous position as they had already approved Sweden's statistics once.

In the opinion of the Swedish NAO the OECD's report is largely based on the NAE's information and calculations. Table 3, which is the basis of the OECD's conclusions, was delivered by the NAE. The assessment that students may have been in Swedish school for three years and nevertheless be correctly excluded, also seems to have been delivered by the NAE. The OECD has then itself added six months in terms of how long students can attend a preparatory class, and made assumptions that all students attend preparatory class, and do so for two and a half years. Our assessment is that the report is based on incorrect assumptions and cannot be used to assess the reasonableness of the high exclusion levels for Sweden in the 2018 PISA survey.

Both the Government and the NAE should have noted that the OECD report contains a number of incorrect assumptions, which makes it difficult to be convinced by the report. Especially since the Government Offices have called attention to deficiencies in the report.

We see several problems with how the assignment to the OECD was given and followed up. Firstly, it may be questioned whether the OECD was the most suitable actor to carry out the assignment. Among other things, because the OECD had already approved Sweden's figures, but also because they lack knowledge of Swedish school for newly arrived immigrants. Secondly, the OECD produced a report that cannot be regarded as credible. Thirdly, after publication of the report both the NAE and the Government have reiterated the OECD's conclusion that the results can be trusted, even though they should have seen the deficiencies.

¹³⁸ Email from the OECD, 5 February 2021.

After the OECD revised its report, the discrepancy between the number of potential exclusions and actual exclusions is larger, but not large enough for the OECD to withdraw its approval of the Swedish statistics. Our interpretation of their answer is that the OECD has in practice revised its criteria for when students can be excluded to *having less than 3 years of teaching in Swedish*. However, we note that this is not how the NAE informed the school coordinators and none of the school coordinators that we interviewed had understood the criteria in this way. Norway has a similar system to Sweden's and makes the assessment that any time in preparatory class is included in the period of instruction in the test language in accordance with OECD criteria.¹³⁹ Finland has a slightly different system and does not always seem to include the time spent in preparatory teaching in the language criterion.¹⁴⁰ Our assessment based on the interviews we have conducted is that many incorrect exclusions of students have been made for reasons other than limited language proficiency.

¹³⁹ Email from Norway's NPM, 23 March 2021.

¹⁴⁰ Email from Finland's NPM, 25 March 2021.

7 Conclusions and recommendations

The Swedish NAO notes that neither the Government nor the NAE have ensured that the 2018 PISA survey was carried out in a reliable way in terms of exclusions and student non-response.

The high level of exclusions in the Swedish PISA survey of 2018 cannot be explained by the number of newly arrived students with less than one year of teaching in Swedish schools. The NAE has provided informative and appreciated information and support efforts, but the school coordinators have understood and applied the criteria differently. The consequence was that many students were excluded on incorrect grounds. The NAE did not subsequently follow up that the implementation ensured a correct sample of students. Finally, the Government and the NAE have not credibly investigated the doubts concerning exclusions in the 2018 PISA survey.

7.1 Shortcomings in the National Agency for Education's provision of information on and follow up of exclusions

The Swedish NAO's assessment is that part of the explanation for the high level of exclusions is that this was the first time the NAE was responsible for implementing the PISA survey. In previous years it was first the then University of Kalmar and then Mid Sweden University that were responsible for implementation. The PISA survey was the last international study for which the NAE took over responsibility for implementation. They already had experience of conducting other international knowledge assessments such as TIMSS and PIRLS.¹⁴¹

A difference between the PISA survey and other international studies is that the PISA survey is based on student samples, while other studies are carried out with class samples. This matters in several aspects. If an entire class is selected to sit, for example, the TIMSS test, it becomes clear to the student as well as to classmates and parents/custodians if they are excluded from sitting the test. It can be stigmatising to be judged as not being able to participate in something that classmates participate in, which probably affects the school coordinators' tendency to exclude students as well as the risk of non-response.¹⁴² If a student is excluded from sitting the PISA test, no-one except the school coordinator and possibly some

¹⁴¹ TIMSS – Trends in International Mathematics and Science Study. PIRLS – Progress in International Reading Literacy Study.

¹⁴² In terms of TIMSS and PIRLS, however, students who have been excluded may be allowed to sit the test so that it is not apparent that they have been excluded.

other teachers will know that the student has been excluded. Another aspect is that in class selection it becomes something that the whole class does, like an (not so) normal lesson on a regular school day. For a student sample, individual students are picked out to leave and do something other than their classmates. Our assessment is that the NAE has not adapted its work with the PISA survey to the risk of exclusion and non-response being higher than in the other international studies.

According to the NAE, the 2018 PISA survey was carried out in the same way as previous rounds.¹⁴³ However, we can see that there are differences in Mid Sweden University's and the NAE's approach that can probably explain the different outcomes in terms of exclusions and non-response to some extent.

The school coordinators have confirmed that the information meetings were good and clear. Many have also related how accommodating and understanding the NAE was of their situation. Our assessment is that this, which is of course a positive opinion, may have had unintended consequences. Some school coordinators have clearly perceived that the regulatory framework for exclusions allowed them to judge for themselves which students were to be excluded. This also applies to the crucial criterion for limited language proficiency, i.e. a maximum of one year of teaching in Swedish, but for that criterion there is no room for assessment – if the student meets the criteria, they should be excluded, otherwise not.

Given the number of schools that excluded more than 20 per cent of the students, the NAE should have become suspicious. In addition, the exclusions should have decreased between the pre-study and the main study, as there were fewer and fewer refugees arriving in Sweden from 2015. Instead, the exclusions increased by approximately 2 percentage points.

However, the follow-up of exclusions became more difficult after the NAE's legal department made a new interpretation of the Personal Data Act in 2016. The new interpretation meant that exclusions for disabilities and limited language proficiency are now reported together. This is a matter that the NAE could have raised with the Government in order to possibly achieve a statutory amendment, which could have resulted in a more functional reporting of exclusions.

In summary, the Swedish NAO's assessment is that the NAE has done what they believed was enough to do the right thing. They have done what the OECD clearly stipulates should be done, but not enough to ensure that the OECD rules on exclusions were applied correctly in schools. Our assessment is that Mid Sweden University made some additional efforts to ensure participation and that this probably contributed to lower levels of exclusion and non-response. Our

¹⁴³ Hellberg, "Skolverkets GD: Inga skäl ifrågasätta vår studie", 2020-06-03; intervju med Skolverket, 15 December 2020.

assessment is also that the NAE has not sufficiently analysed what could explain the high exclusion and non-response levels and has therefore drawn the wrong conclusions.

7.2 The Government has not followed up indications of errors

Representatives of the Government, in consultation with the NAE, contacted the OECD to ask them to review Sweden's data once more when questioning of the low participation in the 2018 PISA survey intensified. Although it is possible to see some advantages of asking the OECD to do this, it is also possible to see several disadvantages. The OECD had already approved Sweden's data. In addition, the OECD has no knowledge of how education of newly arrived students is organised in Sweden and was not able to perform the calculations itself. The assignment given to the OECD was not specified in the offer letter written by the OECD and signed by the NAE. The letter was later used as documentation for the invoice. We also note that the contents of the report delivered at the turn of September/October 2020 do not correspond to what the management of the NAE told the Government it would be.

The Swedish NAO's assessment is that it should have been possible to find a more suitable actor for the assignment in Sweden. This would have been an actor that could both process Swedish microdata and maintain statistical confidentiality, as well as being familiar with the Swedish education system. The Swedish NAO also considers that the opportunity to interview a number of school coordinators has been very valuable in understanding how the implementation was done in schools.

In the opinion of the Swedish NAO both the NAE and the Government should have noted the errors on which the OECD report is based and pointed them out in some context. Instead, they have emphasised that the OECD approves Sweden's exclusions. A reasonable measure from the Government when Government Offices presented documentation that went against the explanations delivered by the NAE would have been to contact the agency and ask for an explanation of the contradictory information. Furthermore, when Government Offices internally reiterated its doubts in connection with the publication of the OECD report, contact between the ministry and the agency should preferably have been made. According to the Government Offices, they have had a dialogue with the NAE at both official and political levels concerning the PISA survey and exclusions. In this dialogue, the NAE has assured the ministry that the high exclusion rate is reasonable. The Swedish NAO has not received any documentation indicating that the questions raised internally at the ministry were discussed with the NAE. The arguments put forward by the NAE to justify the high exclusion rate have been of a different nature and more concerned with the sufficiently high coverage and the

extent to which foreign-born students, i.e. not recently arrived students, are included in the survey.

The NAE is responsible for the implementation of the PISA survey according to the instructions decided by the Government. Consequently, the ultimate responsibility lies with the Government. The Swedish administrative model is based on mutual competence between the Government and its expert agencies. An expert agency must have the ability to deliver what the Government requests. But the Government must also have the ability to request the right information. In addition, the Government has a responsibility to follow up on what is delivered and intervene if it is not of good quality. In this case, there were indications of errors in the implementation of the PISA survey, including in the Government Offices' own documentation. The Swedish NAO's assessment is that there were failings in both directions regarding the 2018 PISA survey. The NAE did not deliver reliable data for the PISA survey. The Government has failed in its follow-up responsibility towards the NAE on this matter. Since the results of the PISA survey are a recurring target indicator, for example in budget bills, this is an important issue. If weaker students in different groups do not participate in the PISA survey to the same extent as others, it may ultimately lead to a failure to implement relevant measures for them.

The PISA survey is sometimes criticised for having become an international school competition where it is important to be ranked as high as possible. However, the main purpose of the survey is to give participating countries a picture of how their education system works and an opportunity to make comparisons over time. To enable this, it is important that participation in the survey is as broad and accurate as possible. If Sweden's aim in participating in the PISA survey is to be able to detect strengths and weaknesses in its own education system, it is important to minimise erroneous exclusions and non-response rates as much as possible.

The Swedish NAO notes that the Government has not taken sufficient measures to investigate the doubts that arose in connection with the 2018 PISA survey. This is not necessarily because rules or processes are incorrectly designed, but on this issue the Government has not fulfilled its responsibility to ensure that subordinate agencies conduct their activities in accordance with the requirements set by the Constitution. The Swedish NAO refrains from making a recommendation on this but considers it a serious matter that the Government has not fulfilled its follow-up responsibility.

7.3 Recommendations

The Swedish NAO makes the following recommendation to the Government:

- Initiate an investigation into the legal conditions for separate reporting of the grounds for exclusion in the PISA survey.

The Swedish NAO makes the following recommendations to the National Agency for Education:

- Improve efforts to ensure correct participation in upcoming PISA surveys. This should entail greater emphasis on the following details of the implementation:
 - Strengthen initial communication with selected schools.
 - Ensure that the instructions are understood and applied correctly by the school coordinators.
 - Follow up the exclusions in more detail by requesting student protocols before the survey is carried out.
 - Raise the level of ambition to reduce non-response through more follow-up opportunities and use the information sent to parents/custodians to emphasise the importance of pupil participation.

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Annex 1. The background to the PISA survey and how it is organised

The PISA survey was developed by the OECD in the late 1990s. The OECD as an organisation was formed with the aim of promoting economic cooperation between countries but has over time gained great importance in the field of education. Among other things, each year they launch the publication *Education at a Glance*, which is primarily a quantitative description of countries' education systems.

The decision to conduct its own international comparative surveys in the field of education came partly from the OECD's criticism of the international surveys conducted by the IEA at that time.¹⁴⁴ The criticism was partly that not all OECD countries participated, and that the performance indicators of the IEA surveys were based on students' knowledge based on curricula, which did not fit well with the OECD's focus on lifelong learning. The starting point for OECD's own surveys was instead what students must know to manage in a modern society.¹⁴⁵

The invitation to participate in the first PISA survey was sent to all member countries in 2000. In Sweden it was the NAE that decided in the same year that Sweden would participate.¹⁴⁶

As more PISA surveys have been carried out and more member and non-member countries joined, the results have also attracted increased attention. In Sweden this has contributed to a debate about Swedish education and discussions about the need for future reforms. After the 2012 survey, the Swedish performance trend was deemed to be so alarming that the Government at the time appointed a school commission and requested help from the OECD to get feedback on what measures should be taken to reverse the negative trend.¹⁴⁷

Ever since the results of the first PISA survey were published, they have been presented in budget bills to highlight the development of Swedish schools. Sweden's PISA results have subsequently been presented as one of several stated indicators to assess achievement of objectives and results in compulsory school. Since Sweden has no national surveys showing trends in schools, PISA results have become an important basis for decisions on measures and direction of policy within the school area.

¹⁴⁴ International Association for the Evaluation of Educational Achievement.

¹⁴⁵ Fredriksson, Karlsson and Pettersson, *PISA under 15 år – resultat och trender*, 2018, p. 15–16.

¹⁴⁶ *Ibid.*, p. 17.

¹⁴⁷ *Ibid.*, p. 175; OECD, *Improving schools in Sweden: An OECD perspective*, 2015.

What does the PISA survey measure?

The purpose of the PISA survey is to regularly examine the degree to which each country's education system contributes to 15-year-olds being equipped to meet the future based on the subject areas of reading, mathematics and science. Unlike the national tests, the international studies are designed to enable comparisons over time and between countries and thus provide valuable information about the Swedish school system.¹⁴⁸

The aim of the PISA survey is also to increase understanding, causes and consequences of observed differences in knowledge. By examining these connections in international comparative studies, countries can detect the strengths and weaknesses of their education systems.¹⁴⁹

How is the PISA survey organised?

The OECD has overall responsibility for developing and managing the PISA survey so that it is implemented in the same way in all countries. However, the practical implementation of the survey involves several actors both internationally and within each country. In this section, we briefly describe the different actors and their respective roles and responsibilities.

OECD

The OECD has both a board and a secretariat responsible for the implementation of the PISA survey. The *PISA Governing Board* is responsible for the overall policy priorities and ensures that these are complied with during implementation. This includes prioritising and deciding on standards for data, analysis and compilation, as well as deciding on the content of the framework that will govern the implementation. The Board consists of representatives from OECD member countries (even non-member countries may participate as observers). The representatives consist of both officials from the countries' responsible ministries or educational authorities, as well as employees and researchers at research and educational institutions.¹⁵⁰ Sweden is represented in this context by the NAE.

Within the OECD there is also a PISA secretariat in Paris, which is responsible for the day-to-day management of PISA. The secretariat works for the Board and is an intermediary between the Board and the international consortium of contractors responsible for the operational implementation of the survey. The secretariat monitors the implementation of the PISA survey and works to create consensus

¹⁴⁸ National Agency for Education, *PISA 2018 – 15-åringars kunskaper i läsförståelse, matematik och naturvetenskap*, 2019.

¹⁴⁹ Ibid., p. 9.

¹⁵⁰ OECD, "PISA FAQ – Governance", retrieved 5 November 2020.

between the participating countries on various policy issues.¹⁵¹ The secretariat also produces indicators and analyses and compiles the international results reports in cooperation with participating countries.¹⁵²

To carry out the survey itself, international contractors (also known as the PISA Consortium) are procured, which under the guidance of the secretariat are to design and implement the PISA survey. In practice, it is the contractors who have the dialogue with each country and provide them with instructions for implementation. Among other things, they are responsible for producing the manual for national project managers, which is the most central operational manual for the PISA survey. A consortium of contractors is procured for each PISA round and usually consists of different testing and examination institutions. Suppliers are selected through an open tendering process.¹⁵³

The Government

Sweden's participation in international knowledge studies is regulated in the instruction for the NAE. This states that after consultation with the Government Offices, the agency may represent the State in international agreements to participate in international knowledge measurements and that the agency is responsible for Sweden's participation.¹⁵⁴ When a country joins the PISA survey, it undertakes to comply with the requirements set by the OECD for implementation.

In Sweden, the Government has thus delegated responsibility for Sweden's participation in the PISA survey to the NAE. The agency is to present the work on the PISA survey in its annual report and publish a report after each completed survey. At both the annual agency dialogue and in ongoing dialogue with the agency, the Ministry of Education and Research must follow up the results that the NAE has achieved based on the agency's instruction and appropriation directions.¹⁵⁵

National Agency for Education

Each country participating in the PISA survey must appoint a 'national project manager' who is responsible for conducting the survey in the country according to the rules and time frames decided by the OECD.¹⁵⁶ Since 2015, the NAE has been the national project manager for the PISA Survey in Sweden. The national project manager must contribute national perspectives on issues relating to policy,

¹⁵¹ OECD, "PISA FAQ – Governance", retrieved 5 November 2020.

¹⁵² OECD, *PISA National Project Manager Manual*, 2017, p. 10.

¹⁵³ Ibid.

¹⁵⁴ Section 4 of the Ordinance with instructions for the National Agency for Education (2015:1047).

¹⁵⁵ Written reply from the Ministry of Education and Research, 18 November 2020.

¹⁵⁶ OECD, *PISA National Project Manager Manual*, 2017, p. 115.

implementation and the analysis and compilation of results that are of particular relevance nationally.¹⁵⁷

To ensure compliance with the rules decided by the OECD in the schools, each participating school must choose a 'school coordinator'. The school coordinators act as a contact person between the school and the national project manager.¹⁵⁸ It is the principal of each school that decides who should be the school coordinator; usually an assistant principal or teacher is appointed. Since the students (since 2015) complete the test and questionnaires on computers, schools must also appoint an IT manager. IT managers play an important role for enabling students to complete the test and are intended to support the school coordinators at the time of the test.¹⁵⁹

The school coordinators play an important role in providing the NAE with lists of which students are present at the school and included in the target group to take the test. It is also the school coordinators who will then identify which students meet the OECD's criteria for exclusion and should therefore be exempt from taking the tests.¹⁶⁰

Although the NAE must relate to the rules set up by the OECD, they play an important role in ensuring the quality of participation. The NAE's role includes training and providing support to the school coordinators in which rules apply to selection, exclusion and non-response. The NAE must also provide the school coordinators with relevant manuals for how the tests should be carried out. This also includes translating and adapting the manuals produced by the OECD so that they are of use in the Swedish context and inform the parents/custodians of the PISA survey. The translation must be done through one of the OECD specific translation processes in order to avoid any deviations from the standards.¹⁶¹ The manual decided by the OECD for national project managers also states that the NAE must ensure that the student lists collected from each participating school are of high quality.¹⁶²

How is the survey implemented?

The PISA survey is intended to be carried out regularly every three years. The implementation of the survey takes place in different phases, consisting of several pre-defined elements and time frames. The actual day of the test is thus only part of the entire implementation of the survey. Overall, the implementation can be described in four phases. The first phase consists of preparatory work, which

¹⁵⁷ OECD, *PISA National Project Manager Manual*, 2017, p. 10.

¹⁵⁸ National Agency for Education, *PISA 2018 Huvudstudie – manual till skolsamordnare*, 2018.

¹⁵⁹ National Agency for Education, *Så här går PISA till – en sammanfattande beskrivning*, 2017.

¹⁶⁰ National Agency for Education, *PISA 2018 Huvudstudie – manual till skolsamordnare*, 2018.

¹⁶¹ National Agency for Education, *Info om hur urvalet görs Pisa*, 2019, p. 3.

¹⁶² OECD, *PISA National Project Manager Manual*, 2017, p. 120.

includes developing test assignments, translation, recruiting staff and starting the selection of schools and student base for the pre-study. The second phase consists of a pre-study. The pre-study is an important part of trying out test questions, translation, methods for collecting and analysing data and training for staff involved. The phase enables the countries to detect problems in implementation that can be corrected before the main study. Any deviations from the regulations must be approved by the OECD before the main study. The main study includes elements similar to the preparatory phase but with a larger sample of schools and students. In the final phase, data is analysed and the OECD produces an international report.

At each test, the intention is that one subject area should be in focus, the 'main subject', but all three areas are tested each time, which enables comparisons over time. One area being the main subject means that the framework for this area is updated and new test items are created. There are also many more test assignments in the main area than in the other areas and thus the results can be presented in more detail for this particular area. In addition, students' approach and attitudes towards the main area are investigated.

Each student must take two tests and answer a questionnaire. The tests take one hour each and the questionnaire takes 45 minutes. The tests consist of multiple-choice questions and open questions and there is a total of about 66 test items. The questionnaires consist of questions about the student's background, student's learning, as well as commitment and motivation to learn the subjects – and much more. The principals of the selected schools also answer a questionnaire on how teaching is organised.

Annex 2. Potential impact of exclusions and non-response on the Swedish PISA results in 2018

In this annex we show how the Swedish PISA results in 2018 would have changed if Sweden had not had such high exclusion and non-response rate. The analysis shows that the results might have been lower if more students had sat the test. Sweden's results also change more than the results for our neighbouring countries when a corresponding analysis is made for these countries. It is important to note that the analysis is only an illustrative example, since it is based on an assumption that all selected students would have sat the tests. This is of course not probable but facilitates comparison between countries.

To investigate how sensitive the Swedish PISA 2018 results are in terms of the sample and number of students who sat the test, we have replicated the method used by the British researchers Anders et al.¹⁶³ to study Canada's PISA results in 2015.¹⁶⁴ The approach assumes that students who are not attending school, students excluded from the study, and students registered as non-respondents probably have a different result distribution in the PISA survey compared to students who actually sat the test.¹⁶⁵ Since we do not know the individual characteristics (we have no microdata for these individuals) of the students who did not participate, we make different assumptions about the PISA results for these individuals. Depending on the assumptions made, the results are affected differently.

The starting point is that the PISA results for non-participants (excluded students, students registered as non-respondents, and 15-year-olds who do not attend school) would be lower than for the students who actually sat the test. Research has shown, for example, that students with a high level of absence perform worse in school.¹⁶⁶ In a previous study this has been shown to also apply to the PISA survey in Canada.¹⁶⁷

It is, of course, not possible to know how much worse non-participating students would have performed in the PISA survey. The analysis therefore examines how Sweden's PISA results in 2018 might have changed under different assumptions

¹⁶³ Anders et al., "Is Canada really an education superpower? The impact of non-participation on results from PISA 2015", 2021.

¹⁶⁴ For more information on the results in this study see Annex 3.

¹⁶⁵ The proportion of 15-year-olds who do not attend school in Sweden is very low and the same applies to our neighbouring countries.

¹⁶⁶ See for example Gottfried, "Excused versus unexcused: how student absences in elementary school affect academic achievement", 2009.

¹⁶⁷ Knighton et al., "Measuring up. Canadian results of the OECD PISA study", 2010.

about how students who were excluded or were non-respondents in the PISA survey would have performed if they had actually sat the test.¹⁶⁸ We also make comparisons with some of our neighbouring countries (Norway, Denmark, Finland and Germany) by performing corresponding analysis for these countries under the same assumptions as for Sweden. This is interesting because some of our neighbouring countries have had significantly lower exclusion and non-response levels than Sweden. For example, Germany had an exclusion rate of about 2.7 per cent in PISA 2018 and the corresponding figure for Finland was 3.4 per cent. In addition, at the end of the annex, a number of alternative calculations are made for Sweden's results in reading to investigate how sensitive the calculations are if we ease some of the assumptions. In these alternative calculations for Sweden we allow, for example, a certain level of exclusions due to the language criterion and cognitive disabilities.

To carry out the analysis, we do the following. First, we take the total number of 15-year-olds in Sweden from the technical report for PISA 2018 (108,622 students) and divide these into two groups: the number of participating students weighted by the final weights (79,604 students) and the weighted number of non-participants (29,018 students).¹⁶⁹ Thus for the participating group, the PISA results are used as described in the international PISA database, but weighted so that the total is 79,604 students. For students who did not participate in the survey, we randomly draw 29,018 results from a normal distribution. This is done using different assumptions about its mean average, but with the same standard deviation as for the participating group. The value used as the mean for this normal distribution corresponds to different percentiles (the 45th, 40th, 35th, 30th, 25th, 20th, 15th and 10th percentiles are used) of the observed PISA results for Sweden (and correspondingly for the neighbouring countries for which we also perform the analysis).

Similar analysis is also conducted for the other two subject areas, science and mathematics. For each of these different scenarios, a random sample of results is drawn for 29,018 observed non-participating students (all of these students receive the weight one) and these results are added to the database of observed data for

¹⁶⁸ The results at individual level in the PISA survey consist of 10 plausible values. To simplify the calculations, the first plausible value is used in the same way as in Anders et al., "Is Canada really an education Superpower? The impact of non-participation on results from PISA 2015", 2021.

¹⁶⁹ We consistently call the two groups participants and non-participants. In reality, the participants are the students who actually sat the test, but here the term participants refers to the total weighted number who actually sat the PISA test. The number of weighted students is taken from the PISA Technical Report, Chapter 11, Table 11.7 and the variable Number of Students Assessed (Weighted). This is the weighted number of students after adjustments for non-response. Since the Swedish NAO has not had access to student weights before adjustments for non-response for countries other than Sweden, the information from Table 11.7 is used for all countries. When student weights before adjustment for non-response are used for Sweden, the results are only marginally affected.

79,604 participating students (which when the weights are applied adds up to represent 108,622 Swedish 15-year-olds).

The analysis makes it possible to take into account how Sweden's performance in PISA 2018 potentially would change in relation to our closest neighbours under different assumptions. Thus, we do not argue that these alternative scenarios are the objectively correct result, but it is interesting to see how the results for different countries change when different assumptions about the results are made for the students who, for various reasons, did not sit the PISA test in 2018. The results thus give a picture of how much exclusions and non-response may have affected the Swedish PISA results in 2018. It is also interesting to make the corresponding calculation for our neighbouring countries which in some cases had significantly lower exclusion and non-response levels.¹⁷⁰

In the analysis, we comment on whether the official results of the 2018 PISA survey are statistically significantly different between Sweden and the other countries examined. However, we do not calculate whether the simulated results are statistically different from each other for the different countries. This is because the simulated results are only meant to serve as an illustrative example where the main interest is on the calculated point estimates and not whether the difference between countries is statistically significant.

Table 4 presents the simulated results for the reading test in PISA 2018. Reading is presented first since this was the main subject in the 2018 PISA survey. Column 1 refers to the percentile in the distribution of reading results in PISA 2018 that the non-participating students are assumed to have if they had sat the test.

¹⁷⁰ For more information on the exclusions and non-response of the different countries, see section 2.3.1.

Table 4 Simulated scores in reading in the 2018 PISA survey under different assumptions about the performance of non-participating students. Results for different countries

Non-participants' scores as a percentile of the observed scores	Simulated PISA scores, mean				
	Sweden	Norway	Denmark	Finland	Germany
Original score	506	499	501	520	498
45	503	497	499	519	498
40	499	495	495	517	496
35	495	492	491	516	494
30	491	489	487	514	492
25	486	486	483	512	490
20	481	482	478	510	487
15	474	478	473	508	485
10	466	472	466	505	481

Source: Swedish NAO's processing of OECD microdata for the 2018 PISA survey.

Sweden's average PISA score in the reading test was 506 points for 2018. This was slightly higher than Germany (498 points), Norway (499 points) and Denmark (501 points), but lower than Finland (520 points). It should be noted that there are no statistically significant differences between Sweden's results and the results for Norway, Denmark and Germany. However, the Swedish results are statistically significant lower than those of Finland.

When we then recalculate the Swedish PISA scores in reading for 2018 under different assumptions about how well the students who did not sit the test might have performed in the survey, we see that the Swedish scores change. When we assume that those who did not sit the test only had marginally inferior average scores (performance on average as the 40th score percentile) than those who sat the test, the Swedish reading score would fall to 499. A change in PISA results for reading that is greater than for comparison countries.

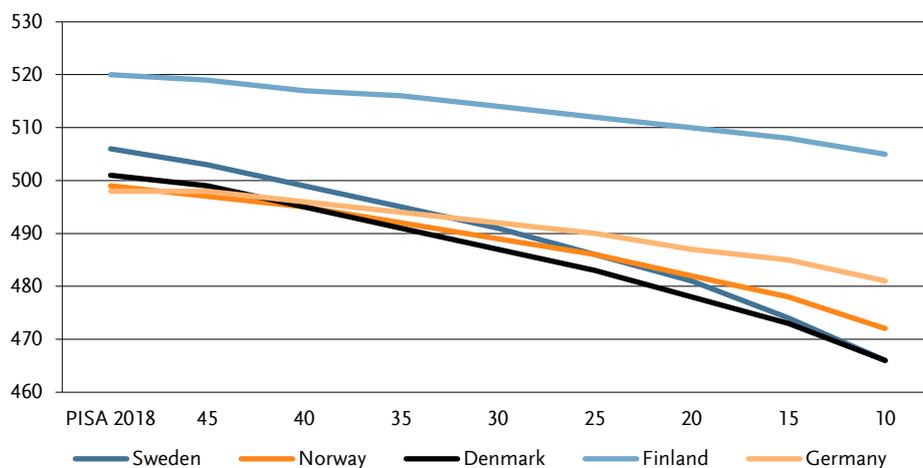
If the assumption about the potential scores for the students who did not sit the test changes, the simulated average reading score also changes. If we assume that students who did not sit the test on average would perform very poorly on the reading test (on average as the 10th score percentile), we would see a much greater impact on the average Swedish reading score. Instead of 506, Sweden would get an average score of 466 points according to this hypothetical calculation. The Swedish score under this substantial assumption about the performance of those who did not sit the test thus changes the average reading score by 40 points. This can be compared, for example, to the Finnish scores, which would only change by

15 points. The explanation why the Finnish results are not affected to the same extent is the low percentage that did not sit the test in the Finnish PISA survey in 2018. The same applies to the German score, which with an assumption that those who did not sit the test would have performed much worse than the students who actually sat the test gives a 17 points poorer reading score.

For Norway and Denmark, the differences in the simulated PISA results are not as large compared to Sweden, but if we were to assume that the students who did not sit the test had performed on average as the 25th score percentile, Sweden would no longer have a better score than Norway. According to this calculation, both countries would get an average score of 486 points and only slightly better than Denmark, which would then have scored 483 points.¹⁷¹ The changes in PISA reading scores using various assumptions about performance for students who did not participate in the test are illustrated in figure 9.

As noted above, the differences between the countries' average PISA results are not statistically significantly different from each other in the official results. The exception is Finland, which had statistically significantly better reading scores than Sweden in PISA 2018.

Figure 9 Changed PISA scores in reading in 2018 for different assumptions about the performance of students who did not sit the test



Source: Swedish NAO's processing of OECD microdata for the 2018 PISA survey.

From figure 9 it is clear that the results for Sweden are most affected among the countries compared when a simulation of PISA results is done for those students who did not sit the test. This is particularly clear in comparison with Finland and Germany.

¹⁷¹ Note that the confidence intervals around the results of the different countries are large and that these differences are not statistically significant from each other.

Table 5 and 6 present the results of the corresponding analysis for the subject areas of science and mathematics in PISA 2018. The results for these subject areas are not commented in detail.

Table 5 Simulated scores for science in the 2018 PISA survey under different assumptions about the performance of non-participating students. Results for different countries

Non-participants' scores as a percentile of the observed scores	Simulated PISA scores, mean				
	Sweden	Norway	Denmark	Finland	Germany
Original score	499	490	493	522	503
45	496	488	489	518	502
40	492	486	486	517	500
35	489	483	483	515	498
30	484	480	479	514	496
25	480	477	475	512	494
20	475	474	470	510	492
15	469	470	463	508	489
10	462	465	456	505	486

Source: Swedish NAO's processing of OECD microdata for the 2018 PISA survey.

For science, the scores show a similar picture to reading. Sweden's score in science in PISA 2018 was 499 points. This was higher than Norway (490 points) and Denmark (493 points), but slightly lower than Germany (503 points) and considerably lower than Finland (522 points). The difference in Sweden's performance level is only statistically significantly lower than that of Finland for science.

Table 6 Simulated scores for mathematics in the 2018 PISA survey under different assumptions about the performance of non-participating students. Results for different countries

Non-participants' scores as a percentile of the observed scores	Simulated PISA scores, mean				
	Sweden	Norway	Denmark	Finland	Germany
Original score	502	501	509	507	500
45	500	500	507	507	499
40	496	498	504	506	497
35	493	496	501	504	495
30	489	494	498	503	494
25	485	491	494	501	492
20	481	488	489	500	490
15	476	484	484	498	488
10	469	480	478	496	485

Source: Swedish NAO's processing of OECD microdata for the 2018 PISA survey.

The differences in the official results between the compared countries are significantly smaller in mathematics for PISA 2018. Students in Denmark performed best, with 509 points, followed by Finland with 507 points. Other countries that are compared received just over 500 points in the survey. The differences between countries are not statistically significant.

The analysis presented above for the different subject areas is based on assumptions that probably are not fulfilled, but by making the same assumptions for all countries, it is easier to compare how the results in different countries could potentially be affected if all selected 15-year-olds in the country had participated in the PISA survey. To examine the sensitivity of the results to these assumptions, analyses are presented below for Sweden where we allow a certain number of students not to participate in the PISA test for various reasons.¹⁷² This sensitivity analysis is only performed for the results in reading, which was the main subject in the PISA survey in 2018.

In the first of these analyses (option 1) we allow 2.5 per cent excluded students due to the high refugee immigration to Sweden in the years before the PISA 2018

¹⁷² In these analyses, the various permitted exclusions are modelled by not adjusting the Swedish PISA results for all 15-year-olds in Sweden for the PISA survey in 2018.

survey.¹⁷³ It should be noted, however, that some of Sweden's neighbours also received relatively many refugees during this period. However, there is a great difference in whether these countries have excluded many students or not due to the language criterion. For example, Germany, like Sweden, received many refugees in the years before the PISA survey in 2018 but despite this still has very few exclusions due to the language criterion (0.4 per cent).

In a second analysis (option 2), we also allow for over-coverage of 3.1 per cent (equivalent to 3,344 students) for Sweden. According to the NAE, the main over-coverage in the PISA 2018 survey is due to three closed compulsory schools and the selected upper secondary schools that had no students born in 2002.¹⁷⁴

In a third analysis (option 3), in addition to the exclusions described above, we allow that the results for 0.7 per cent of students are not being simulated (798 individuals) due to a discrepancy between the total number of individuals born in 2002 and the total number of individuals born in 2002 in Swedish school year 7 or higher.¹⁷⁵

In the concluding analysis (option 4), all exclusions above are allowed and in addition we allow the exclusion of 1.7 per cent due to cognitive disabilities.¹⁷⁶ The results of the different sensitivity analyses for the reading subject area are presented in figure 10.

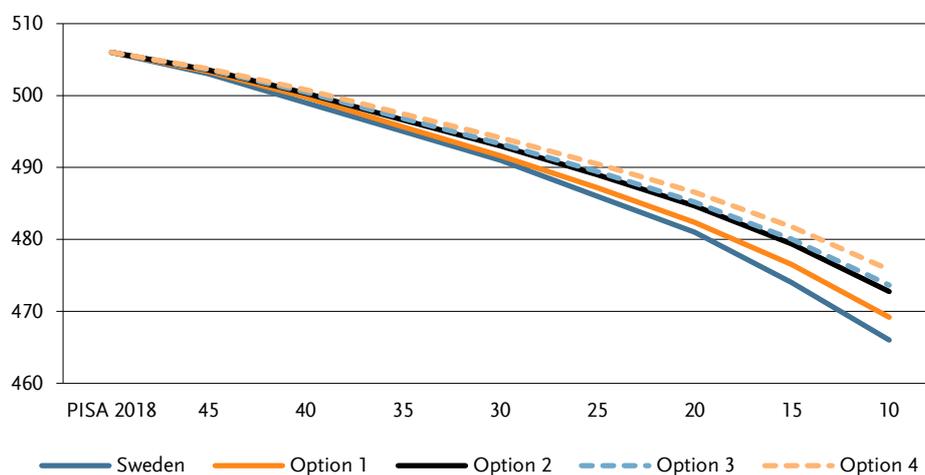
¹⁷³ See section 4.3 for our reasoning as to why we believe that an exclusion rate of 2.5 per cent due to the OECD's language criterion for the PISA survey is reasonable to assume.

¹⁷⁴ Written reply from the National Agency for Education, 15 March 2021.

¹⁷⁵ Ibid.

¹⁷⁶ 1.7 per cent corresponds to the median value of exclusions due to cognitive disability for participating OECD countries.

Figure 10 Changed PISA scores in reading in 2018 for Sweden under different assumptions about allowed exclusion and different assumptions on the performance of students who did not sit the test.



Source: Swedish NAO's processing of OECD microdata for the 2018 PISA survey.

From figure 10 we can see that the change in Sweden's potential results in reading, under different assumptions as to which exclusions are allowed in the simulation, is relatively small as long as we do not assume that the non-participating students would perform at a very low level. For example, the difference between the original simulation (where no exclusions and non-response are allowed) and option 4 (where we allow exclusions due to the language criterion, due to over-coverage and exclusions due to cognitive disabilities) is approximately 3 PISA points when we assume that non-participating students would perform at the 30th score percentile. When assuming instead that non-participating students on average would perform on the 10th score percentile, the difference in simulated results between the original simulation and option 4 is approximately 10 PISA points.

Annex 3. Research on exclusions and non-response in the PISA survey

There exists an extensive research literature, increasing over time, concerning the PISA survey. Most of the research is about how students' results are affected by variables related to socio-economics, school, class, and students' self-perception and confidence in their own ability. The second-largest category of research concerns different types of criticism of the survey and is usually about the design of the test and how the questions are constructed, but also about analysis and interpretation of the results. A further category that is common in research on the PISA survey is articles that are policy-oriented and examine the impact the survey has had on countries' education policies.¹⁷⁷ In this chapter, however, the focus is on the research that has investigated how the sample of students and student exclusions and non-response may affect the results of different countries and thus the comparability between countries and over time.

Anders et al.¹⁷⁸ analyse Canada's results in PISA 2015. Canada is a country that has performed very well in the PISA surveys. The authors note, however, that Canada has a comparatively high student exclusion rate, low levels of school participation and high rates of student absence. This combination leads the researchers to conclude that there are serious problems with comparing the PISA 2015 data for Canada to other countries. In a series of sensitivity analyses, the researchers show that Canada's PISA results would be lower than other high-performance countries such as Estonia, Finland, Japan and South Korea if the country had not had such a high proportion of excluded students and the high level of non-response. To improve the comparability of PISA results between countries, the authors suggest that a country's minimum permitted response rate should be raised from 80 per cent to 90 per cent and that the OECD's 5 per cent criterion for student exclusions should be much more strictly applied. A further recommendation is that the non-response bias analysis by the OECD should be more thorough and more transparent. For example, the OECD could provide a "security rating" from 1 to 5 for the reliability of a country's statistics.

Aursand and Rutkowski¹⁷⁹ study possible explanations for the increasing and relatively high exclusion rates in Norway in the PISA survey between 2000 and 2018. Through interviews with school leaders, the researchers seek answers to the

¹⁷⁷ For an overview of various research studies that have studied PISA, see Hopfenbeck et al. "Lessons Learned from PISA: A Systematic Review of Peer-Reviewed Articles on the Programme for International Student Assessment", 2018.

¹⁷⁸ Anders et al., "Is Canada really an education superpower? The impact of non-participation on results from PISA 2015", 2021.

¹⁷⁹ Aursand and Rutkowski, "Exemption or Exclusion? A study of student exclusion in PISA in Norway", 2021.

question why Norway's exclusion rate increase is among the largest in the OECD countries. By interviewing 6 school leaders about exclusions and which students at each school these school the leaders would have excluded from the PISA survey, the authors show a high degree of subjectivity among school leaders regarding exclusions. The results show, among other things, that school leaders in some cases want to minimise any feelings of failure among the students by excluding them from the test. Furthermore, the results show that some school leaders confused the OECD 's exclusion criterion regarding time in Norwegian school with the time a student can attend preparatory class. Two school leaders stated that all preparatory class students should be excluded from the test. The researchers also point out that small subtle differences in language usage may have an impact on which students the school leaders choose to exclude. One conclusion of the research is that it may be important to provide extra guidance to school management at schools that have preparatory classes.

Durrant and Schnepf¹⁸⁰ analyse PISA data for England and more specifically as to whether the non-response in the surveys in 2000 and 2003 risks distorting the results. By using detailed administrative data for all students selected for the survey, the authors can study which student characteristics are correlated with non-response at both school and student levels. Of particular interest is whether students' ability is related to the non-response. The results show that schools with on average low-performing students have a higher non-response rate than other schools. When the analysis is carried out at the student level, the result clearly shows that low-performing students have a much higher probability of belonging to the non-response group. The researchers recommend that similar non-response analyses should be carried out regularly for the PISA survey and that additional statistics should be collected to improve future non-response analyses. Finally, it is pointed out that schools have an impact on the non-response rate and the authors recommend close cooperation with schools to encourage students' participation.

Schuelka¹⁸¹ discusses that all major international knowledge surveys, such as PISA, exclude students with disabilities and states that this can make the surveys unrepresentative. Furthermore, the author argues that the exclusion of these students risks marginalising this group of students and means that the study performance of students with disabilities is not given attention in the school debate and by politicians.

¹⁸⁰ Durrant and Schnepf, "Which schools and pupils respond to educational achievement surveys?: a focus on the English Programme for International Student Assessment sample", 2018.

¹⁸¹ Schuelka, "Excluding students with disabilities from the culture of achievement: the case of the TIMSS, PIRLS, and PISA", 2013.

Brzyska¹⁸² analyses trends in the proportion of excluded students with special needs¹⁸³ in the PISA surveys. The author argues that changes in definitions and legislation in participating countries in terms of students with special needs could affect the response rate and results of the test. Given the importance of the results in the PISA survey in many countries, the author sees a risk that countries use the exclusion criteria as a way to improve their position compared to other countries. One way to deal with the problem could be that the OECD publishes the percentage of students with special needs excluded from the national selection of students and the percentage of students with special needs throughout the country in the National PISA Reports.

Rutkowski and Rutkowski¹⁸⁴ argue that it is important to understand the limitations in the use and interpretation of PISA data since the survey is so influential. The authors therefore discuss a number of methodological areas (selection of participants, model for estimating results and trend measurements) within PISA and point to the need for caution in the use and interpretation of PISA results. Particularly important is the effect of measurement errors in the PISA survey because the aim of the survey is to express how well prepared the target population of 15-year-olds is to meet the challenges of today's knowledge society. In the study, the researchers point out that the set limit of maximum 5 per cent exclusions is intended, according to the OECD, to ensure that the national PISA result should not fluctuate more than 5 points on the PISA scale due to exclusions. However, a higher proportion of excluded students can lead to distortions that are greater than expected and thus possibly incorrect conclusions.

Since the problems of measurement errors and thus statistical uncertainty are often buried among other details in different PISA reports, the researchers recommend that a dedicated limitations chapter or section be included in every PISA report. This sort of addition could include links to more in-depth information along with standard statements that would be suitable for reporters, policymakers, and other stakeholders to use. This standardized section would allow readers to more efficiently and effectively understand the key limitations associated with PISA methods and results. Furthermore, the authors argue that it should be clearly marked in all tables and results which countries did not meet the sampling standards.

Leroy¹⁸⁵ analyses data from the PISA surveys between 2003 and 2012 for students with special needs. The authors point to three main problems in this area of the PISA survey. Firstly, no report on students with special needs is published regularly in connection with each PISA survey. Secondly, the OECD controls

¹⁸² Brzyska, "Trends in exclusion rates for students with special educational needs within PISA", 2018.

¹⁸³ Students with *special educational needs* (SEN).

¹⁸⁴ Rutkowski and Rutkowski, "A Call for a More Measured Approach to Reporting and Interpreting PISA Results", 2016.

¹⁸⁵ LeRoy et al., "Students with special educational needs within PISA", 2018.

access to statistics on students with special needs, which makes it difficult for researchers to analyse the issue. Thirdly, there is no standard format for reports on students with special needs within the OECD/PISA survey. Finally, the authors point out that there are major differences in how disability is classified in different countries. The definition of a disability is often very broad and subjective, especially when it comes to cognitive and emotional disabilities.

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