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Learning in rural schools: Insights from PISA, TALIS and the literature

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LEARNING IN RURAL SCHOOLS: INSIGHTS FROM PISA, TALIS AND THE LITERATURE

OECD Education Working Paper No. 196

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Abstract

Based on a review of previous research, the paper describes the distinctive characteristics of rural areas and communities and the factors typically associated with shaping students' learning experience in rural contexts. Data from the OECD Programme for International Student Assessment (PISA) 2015 and the Teaching and Learning International Survey (TALIS) 2013 are analysed to examine differences in learning outcomes and education expectations between rural and urban students and to assess the extent to which challenges and opportunities in the provision of rural education are commonplace across OECD member and partner countries. To our surprise, some of the perceived challenges of providing rural education, such as an inadequate infrastructure or a lack of quality teachers, are far from universal. Rural-urban gaps in academic performance generally disappear after accounting for socio-economic status and rural students are less likely to expect completing a university degree than city students, but this gap in expectations persists even when rural students have a similar socio-economic status, on average across OECD countries. This highlights the importance of raising aspirations and creating opportunities for rural students. The paper concludes with ideas for policy and country experiences that governments may consider to ensure high quality learning for students in rural contexts.

Résumé

Ce document de travail, fondé sur une analyse de la littérature antérieure, expose les traits caractéristiques des zones et communautés rurales et les facteurs qui sont généralement associés à l'expérience d'apprentissage des élèves dans un contexte rural. Des données issues du Programme international de l'OCDE pour le suivi des acquis des élèves (PISA) 2015 et de l'Enquête internationale de l'OCDE sur l'enseignement et l'apprentissage (TALIS) 2013 sont analysées de façon à établir quelles sont les différences en matière de résultats d'apprentissage et d'attentes éducatives entre les élèves des zones rurales et urbaines, et à évaluer si les défis et opportunités dans l'éducation scolaire rurale sont les mêmes dans tous les pays membres de l'OCDE et des pays partenaires. Étonnamment, certains des défis perçus comme associés à l'éducation rurale, tels qu'une infrastructure inadaptée ou le manque d'enseignants de qualité, sont loin d'être universels. Les écarts entre zone rurale et zone urbaine en matière de rendement scolaire disparaissent en général après avoir pris en compte le statut socio-économique. En revanche, les étudiants des zones rurales ayant en moyenne dans les pays de l'OCDE des attentes moins élevées d'obtenir un diplôme universitaire que les élèves des zones urbaines, même lorsque ceux-ci ont un statut socio-économique comparable, il apparaît primordial de faire grandir ces attentes et de créer des opportunités pour les élèves des zones rurales. Dans sa conclusion, ce document de travail évoque des idées de politiques et d'expériences menées par différents pays dont pourraient s'inspirer des gouvernements qui souhaitent garantir un enseignement de qualité aux élèves dans un contexte rural.

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1. Introduction

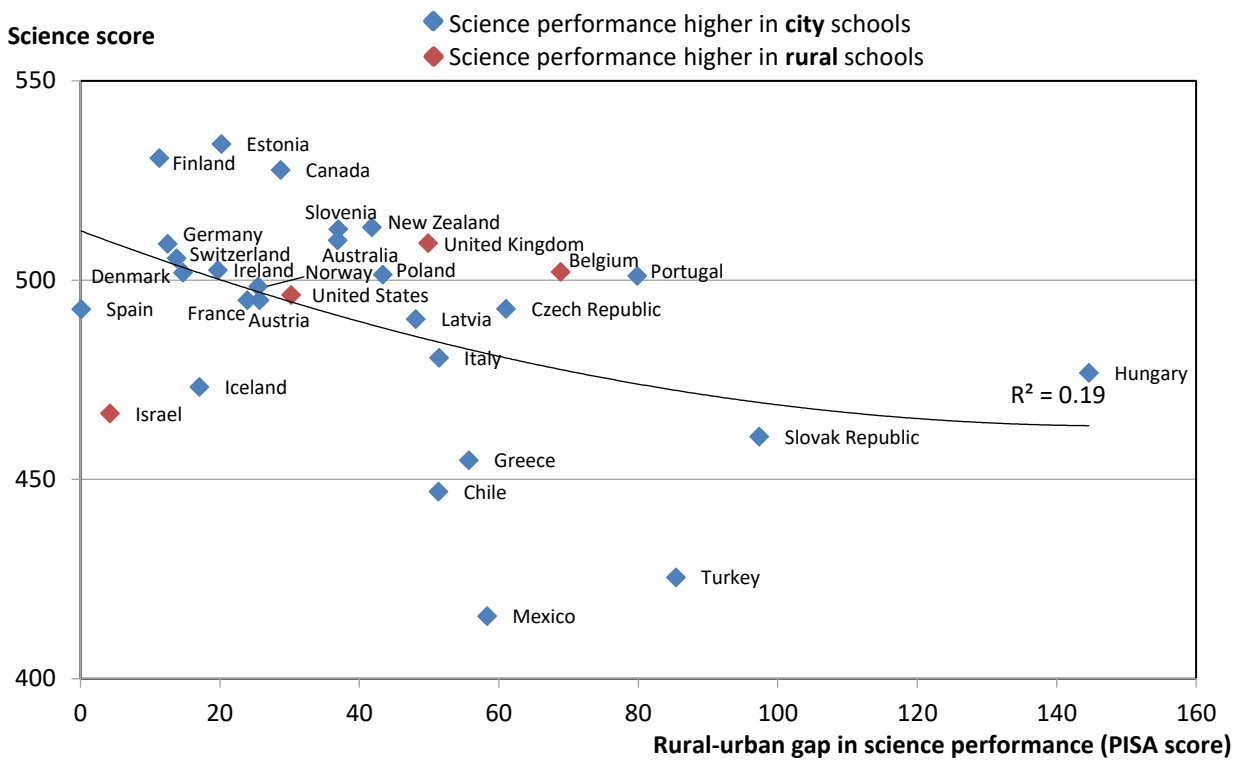
Learning in rural schools in many OECD countries once took place in one-room schools with a single teacher educating, taking care of and supervising students of diverse ages. While multigrade teaching is still common in many schools across OECD countries today (Ares Abalde, 2014[1]; OECD, 2018[2]),[1] increased government spending, better communications and higher educational expectations have given way, in many instances, to learning in larger schools with several classrooms, teachers and grades (Egelund and Laustsen, 2006[3]; McIntosh, 2005[4]). The delivery of rural education may have come a long way since the time one-room schools proliferated, but some of the challenges and opportunities particular to rural education have not changed drastically, while new ones have emerged.

There is not a one consistent way of defining "rurality": rurality has been defined as socially constructed and based on more abstract characteristics, such as feelings of community and traditionalism, or more concrete features, such as landscapes or occupational structures (Halfacree, 1993[5]; Rye, 2006[6]). Statistical definitions have been based on different demographic, geographic and socio-economic factors such as population density, distance or economic development.[2] At the same time, rural areas present a great diversity among them in terms of topography and social, cultural and economic characteristics both within and across countries (e.g. islands, deserts, mountains or plains; lively or declining; stable, depressed, high growth, reborn rural or isolated; fringe, distant or remote) (Arnold et al., 2005[7]; Gjelten, 1982[8]; Showalter et al., 2017[9]; OECD, 2019[10]). Likewise, "rural schools" can be defined differently, and this definition can be based directly on the school or some other unit (e.g. district or municipality).

More generally, one needs to consider the similarities and differences in social, economic and other contextual factors and the way they interact with educational processes and outcomes in different places beyond an "urban-rural" dichotomy (Biddle and Azano, 2016[11]; Burdick-Will and Logan, 2017[12]). Some urban areas may have more in common with some rural communities in terms of educational disadvantage than with other parts of the same city. For instance, declining populations not only pose challenges to rural communities, but may also be an issue for some inner-city neighbourhoods. In the United States, for example, some urban school districts, such as Baltimore, Chicago, Detroit and Philadelphia, have consolidated their school networks to respond to declining student enrolments and performance concerns (Lee and Lubienski, 2016[13]; Steinberg and MacDonald, 2019[14]). Similarly, pedagogical practices and methods from one context may provide useful lessons for another, as Domingo Peñafiel and Boix Tomàs (2015[15]) argue for the teaching of multigrade classes in small rural schools. As their study highlights, practices from these settings, such as teaching methods, assessments, the organisation of space and time, and the use of specific materials, may be informative for the creation of learning environments that respond to individual student needs more broadly.

Figure 1. The rural-urban gap and average science performance

OECD countries

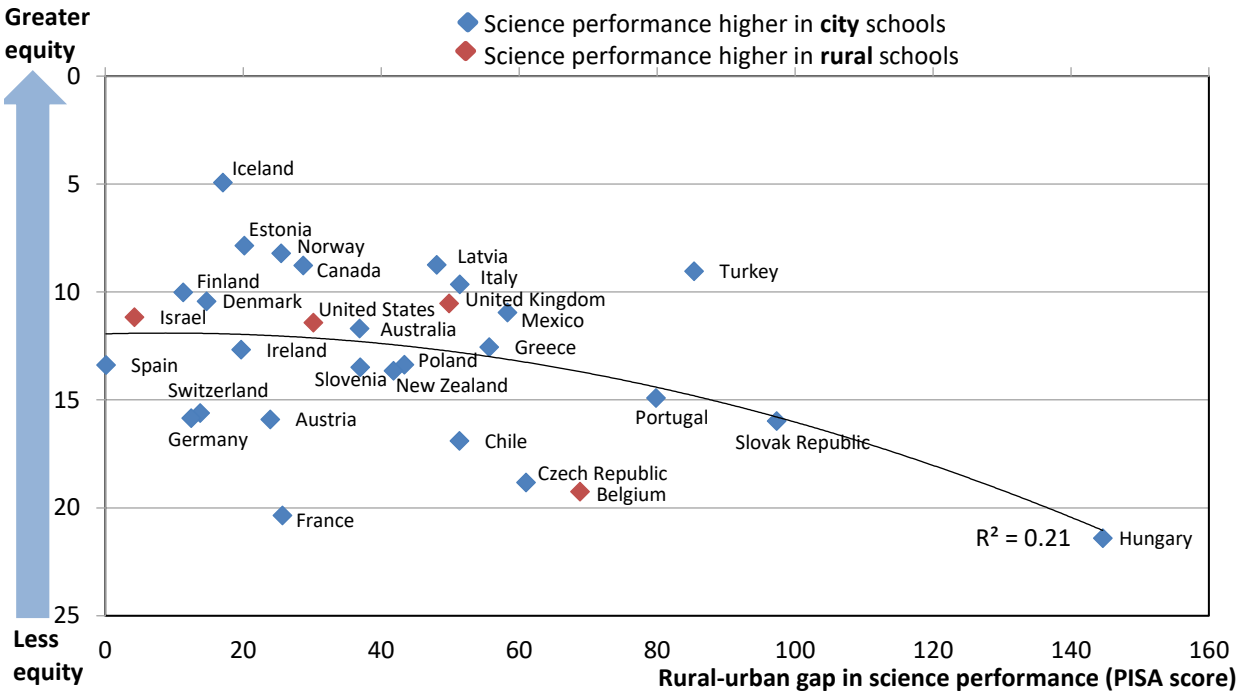


Notes: All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

One can argue about the value of place and space for the analysis and design of policies and practices, including for regional development policy (Barca, McCann and Rodríguez-Pose, 2012[16]; OECD, 2010[17]). However, the delivery of education and other services in rural areas presents a series of common features, namely long distances and a lack of critical mass, that affect their price and/or quality negatively (OECD, 2010[17]). Low population density means that rural areas find it more difficult to take advantage of scale economies and network effects, and the long distances increase the travel, communication and training costs (Asthana et al., 2003[18]; OECD, 1993[19]). As a result, many rural families deal with unavailable, costly or inadequate services, especially in those sectors where government spending is marginal (OECD, 2010[17]). Spatial differences in education quality and outcomes, therefore, touch upon questions of equity, and merit an analysis of the factors and conditions in diverse geographical locations that explain these differences. Such analysis can then inform policies and research that is aware of the importance of place (Bæck, 2015[20]).

Moreover, ensuring that all schools regardless of geographical location achieve high standards may not only support equity, but also enhance the performance of the entire education system. As data from the OECD Programme for International Student Assessment (PISA) for 2015 reveal, school systems that have been successful in closing the rural-urban gap show a higher academic performance (Figure 1) and equity (Figure 2). Similarly, previous studies suggest that countries that have closed the rural-urban gap in infrastructure have been more successful developing economically (OECD, 2016[21]).

Figure 2. The rural-urban gap and equity in science performance
OECD countries



Notes: Equity is the percentage of the variation in science performance explained by the PISA Index of Economic, Social and Cultural Status.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

The paper starts by describing the distinctive traits of rural areas and communities before analysing the performance and achievement of rural students. The subsequent sections consider some of the issues typically identified with providing rural education, mainly drawing on research from Anglo-Saxon, Ibero-American and Scandinavian contexts. Based on data from the OECD Programme for International Student Assessment (PISA) 2015 and the Teaching and Learning International Survey (TALIS) 2013, the paper evaluates to what extent these challenges and opportunities are commonplace across OECD member and partner countries.[3, 4] Comparative research on rural education is rare and, to our knowledge, this is one of the first papers looking at the factors shaping students' learning experience in rural communities from an international perspective. To conclude, the paper suggests ideas for policy that governments may consider to ensure high quality learning in rural contexts.

The study looks at rural education based on the classification of the OECD's large-scale education assessments and surveys. Accordingly, schools in "a village, hamlet or rural area with fewer than 3 000 people" are considered rural and those in cities (with over 100 000 people) are considered urban (OECD, 2016[22]; OECD, 2014[23]). This definition makes no distinction among rural schools, for instance between rural and remote schools. Another aspect to consider is that PISA and TALIS data provide information for 15-year-olds and lower secondary education respectively. In this regard, readers should bear in mind that the share of students enrolled in rural schools is larger in primary than in secondary education. Yet, some of the features typically associated with rural schools, such as multigrade classrooms, are more frequently observed in primary than in secondary

education. Besides, readers should be cautious in interpreting the PISA results when the sample sizes are just above the reporting thresholds, and be aware that only countries and economies with enough sampled students and schools in rural areas and cities are analysed (see Table A.1).

2. What makes rural areas different?

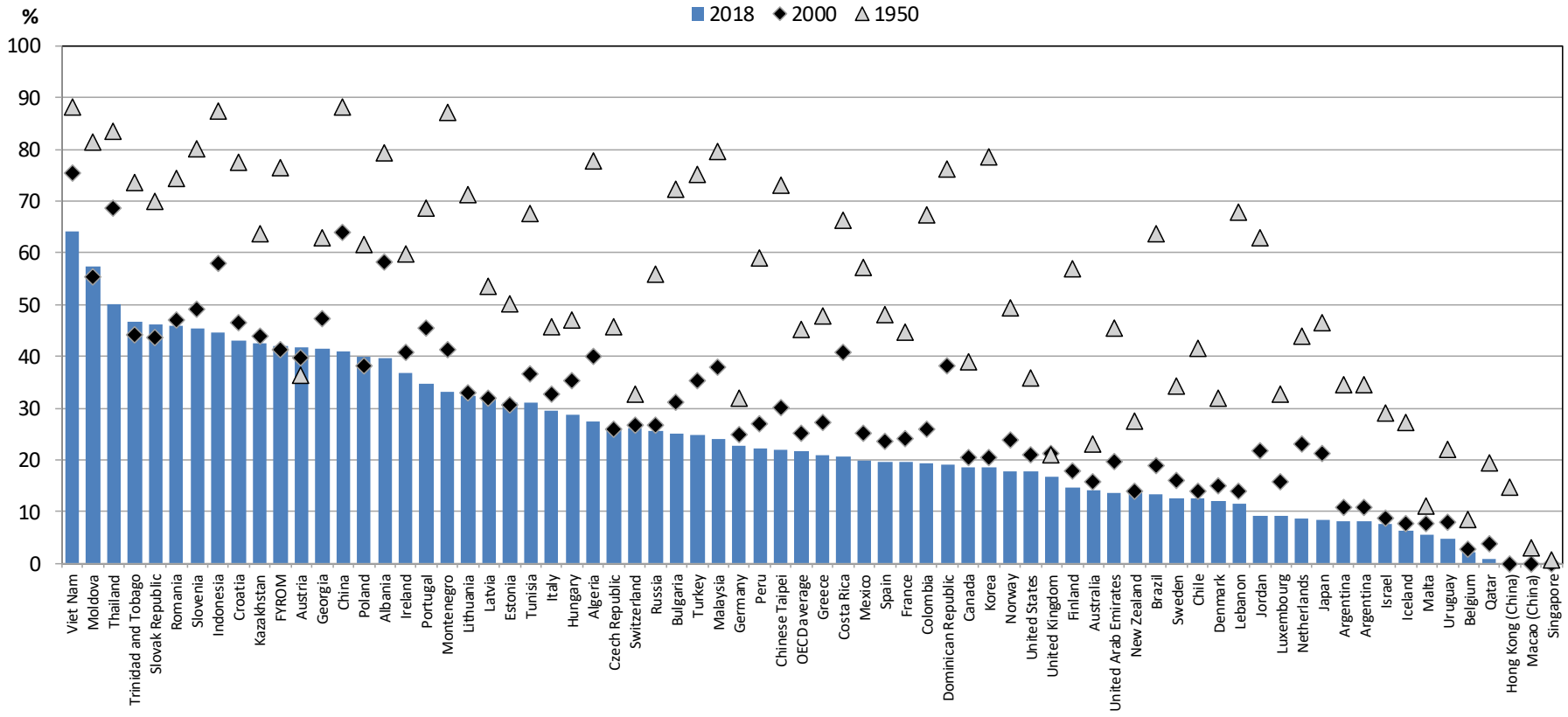
An analysis of rural education requires a clear understanding and proper delineation of the context in which rural schools operate. While no two rural areas are the same, the following traits define rural communities, to a greater or lesser degree, across OECD countries, and should be taken into consideration when designing policies for rural education:

- ***Geographical distance***: rural communities tend to be at a significant geographical distance from other populated centres. The remoteness and accessibility of rural communities shape, among other things, their capacity to hire, retain and develop professionals, the ability of residents to communicate, socialise and work beyond their local community, or the possibility to bypass local services.
- ***Small population size and sparse population***: by definition, rural areas are thinly populated. When delivering services, scarcely-populated areas find it difficult to reach a critical mass and take advantage of economies of scale, resulting in few, costly or inadequate services (OECD, 2010[17]). For the case of education, this means that rural schools are typically smaller than schools in other contexts. Looking at data from PISA 2015, for example, there are 369 students enrolled in the secondary rural schools attended by 15-year-olds compared to 890 in urban schools, on average across OECD countries. In Mexico, Portugal and the United States, the difference in enrolment between rural and urban secondary schools is 1 000 students or more (OECD, 2016[24]). These differences should be even larger in primary education.

  A dwindling share of the population: Fuelled by productivity gains in agriculture, economies of agglomeration, lower fertility rates or migration to urban areas, the population in rural areas has been on the decline in the last century in most developed countries (OECD, 2013[25]). On average across OECD countries, about 22% of the population lived in rural areas in 2018, compared to 45% almost seventy years earlier (Figure 3). The emergence of a lifestyle migration (Benson and O'Reilly, 2009[26]), the Internet, new economic activities, such as rural tourism or renewable energies, and a boom in natural commodities have slowed down, and even reversed, the loss of rural population in some countries during the last decade (Johnson and Strange, 2009[27]). However, the concentration of population in urban areas is still growing in most OECD countries, particularly so in Japan, the Netherlands, Portugal and Turkey.

  Low fertility rates, the out-migration of young people and increases in life expectancy also contribute to changing demographics and age composition of rural areas. While not true for all countries, rural (and intermediate) regions in the OECD tend to have a higher ratio of the elderly to the working population, creating potential challenges to generate sufficient resources to provide for social needs and public services (OECD, 2013[25]).

Figure 3. Share of rural population



Notes: Rural population refers to people living in rural areas as defined by national statistical offices.
The figure shows countries that participated in PISA 2015 with available population data.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: United Nations, Department of Economic and Social Affairs, Population Division (2018). World Urbanization Prospects: The 2018 Revision, Online Edition. https://population.un.org/wup.

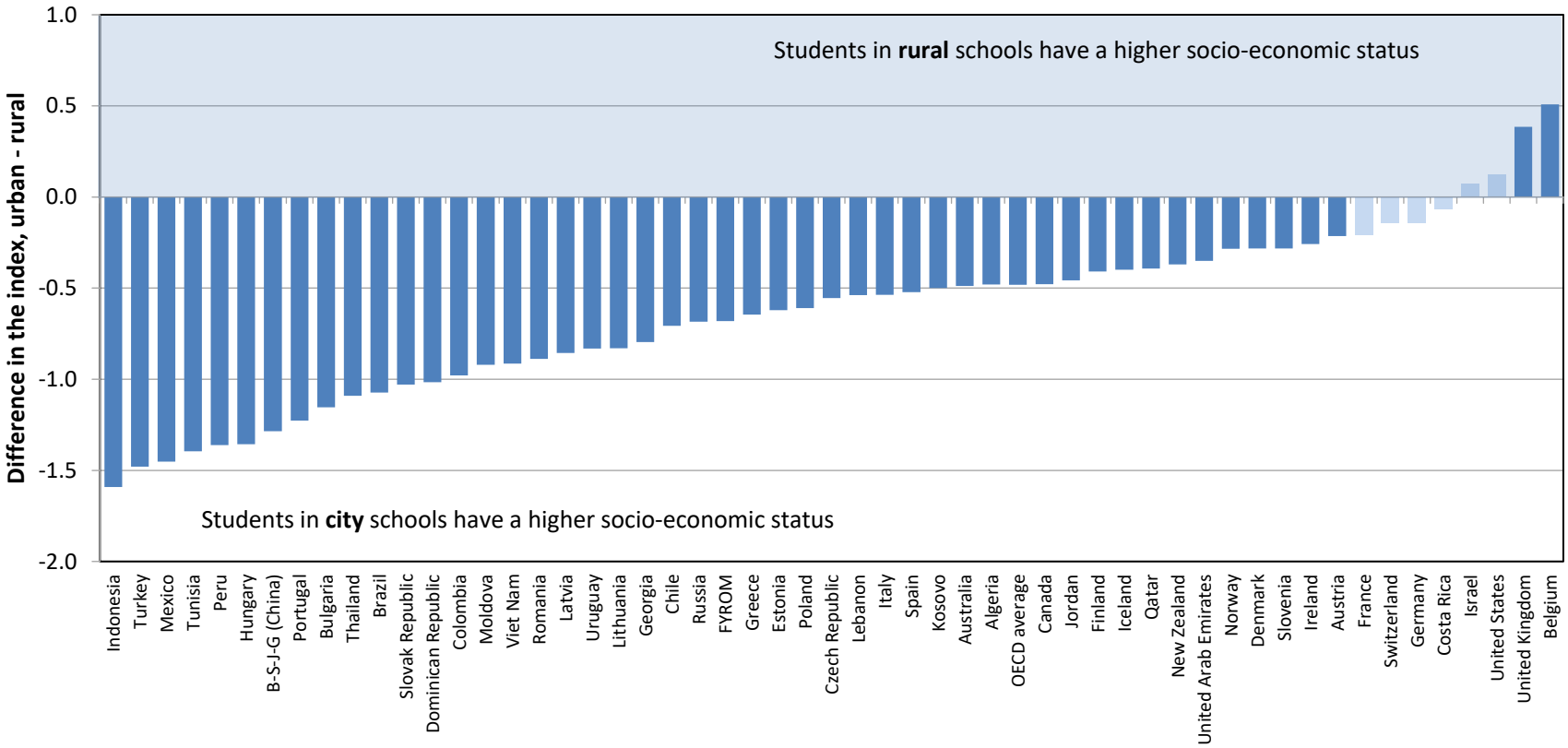
Unclassified

- ***Low socio-economic status***: rural communities tend to be poorer than urban areas, especially in developing countries, but also elsewhere (Bird et al., 2002[28]; Lichter and Schafft, 2016[29]). Across the countries and economies that participated in PISA 2015, only in Belgium and the United Kingdom the PISA index of Economic, Social and Cultural Status (ESCS), which is based on occupational prestige, education levels and home possessions, is higher among rural than among urban families. Only in six countries, namely Costa Rica, France, Germany, Israel, Switzerland and the United States, there is no socio-economic gap among rural and urban families (Figure 4). In all other countries, particularly in Hungary, Indonesia, Mexico, Peru, Tunisia and Turkey, socio-economically disadvantaged students are more frequently found in rural than in urban schools. In rural communities, therefore, the capacity to provide or pay for quality services – compensating for the lack of a critical mass – is often constrained. Rural students are also more likely to work for pay than urban students in a number of countries (Figure 5), presumably reducing the time they can spend learning.
- ***Ethnically homogeneous and socially cohesive communities***: Rural areas are believed to be mostly peaceful and friendly environments where local residents form close, stable and largely ethnically homogeneous relationships (Bauch, 2001[30]; Lewicka, 2005[31]; Little, Panelli and Kraack, 2005[32]; Onyx and Bullen, 2000[33]). Several studies have identified the residential stability of rural areas, rather than their "rurality" or their ethnic homogeneity as the main factor behind the strong community attachment and overlapping networks of friendships in local communities (Gans, 1962[34]; Kasarda and Janowitz, 1974[35]).

  Some rural places have also experienced increasing ethnic and cultural diversity as a result of international migration (e.g. migrants filling labour shortages in low-wage and low-skilled jobs in agriculture and construction). Migration in these places may have potentially large social implications as new migrants will present a higher share of the population in small rural communities (Brown, 2010[36]; Lichter, 2012[37]; Kasimis, Papadopoulos and Zacopoulou, 2003[38]; Rye and Scott, 2018[39]). The largest share of international migrants, however, still typically settles in urban areas (Nachtigal, 1997[40]), among other reasons because they find greater job opportunities and can make use of pre-existing social networks.

  Data from PISA 2015 reveal that, in about half of participating education systems, the share of students with an immigrant background is lower in rural than in city schools (Figure 6). Rural-urban differences are particularly large in those countries with the largest shares of immigrants overall. In Canada, for instance, just 9% of students in rural schools have an immigrant background, compared to about 45% of students in city schools. Rural-urban differences of at least 20 percentage points are observed also in Australia, Austria, Belgium, Germany, New Zealand, Qatar, the United Arab Emirates, the United Kingdom and the United States.

Figure 4. The rural-urban gap in students' socio-economic status



Notes: Statistically significant differences are marked in a darker tone.
The socio-economic status is measured by the PISA Index of Economic, Social and Cultural Status.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

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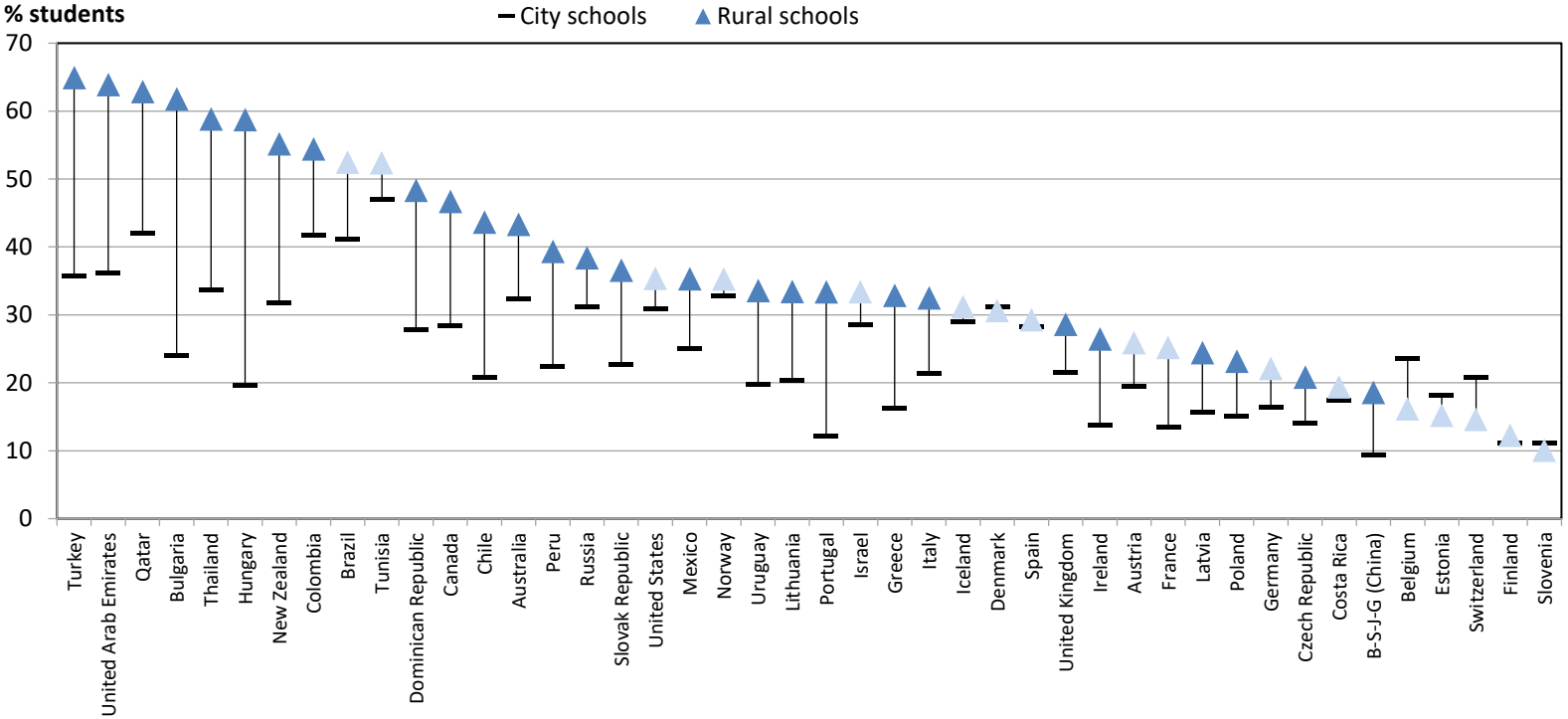
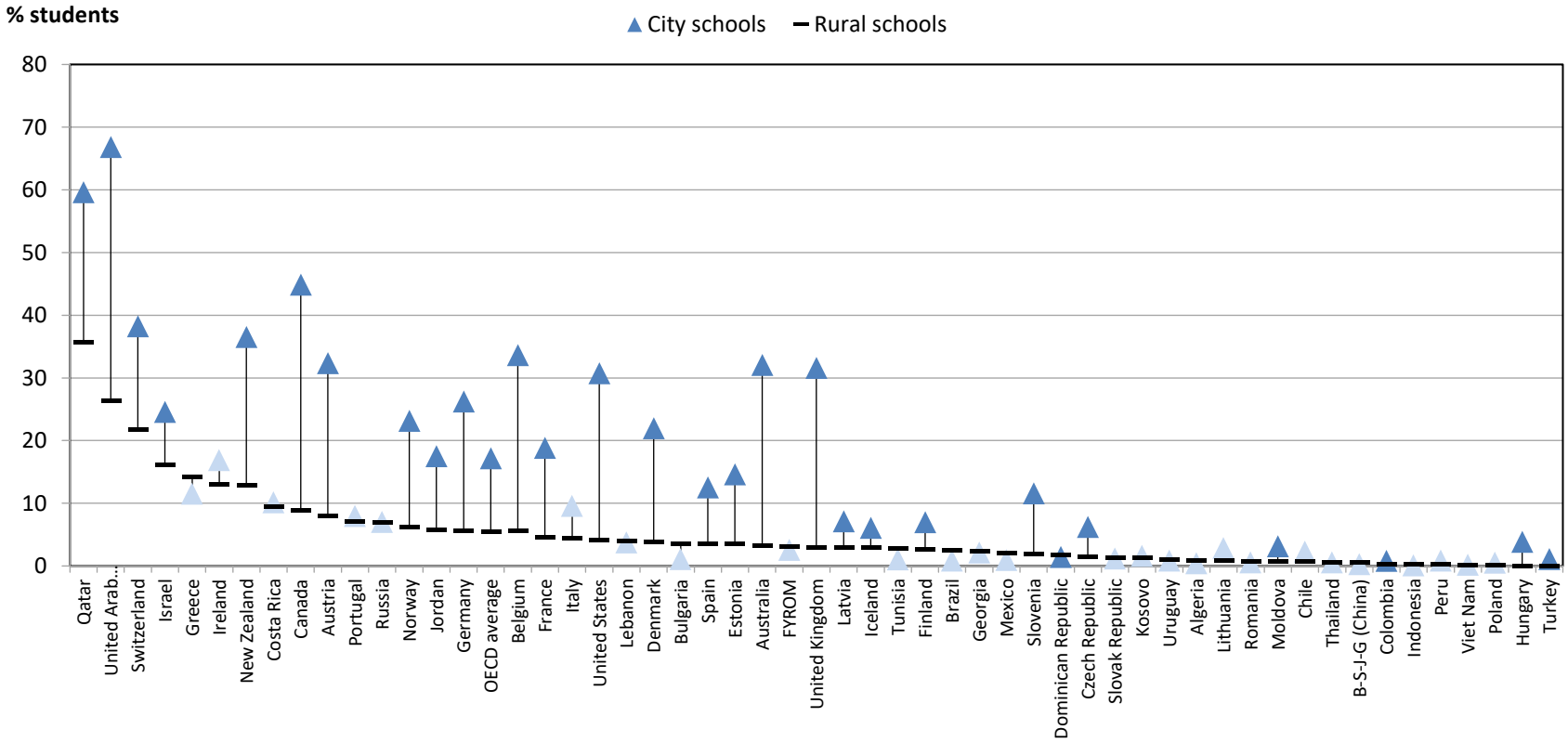
Figure 5. Share of students who work for pay outside of school, by school location

Based on students' self-reports



Notes: Students were asked whether they worked for pay in the most recent day they attended school.
Statistically significant differences are marked in a darker tone.
Only countries that distributed the computer-based questionnaires are shown.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/.)

Figure 6. Share of students with an immigration background, by school location



Notes: Students with an immigrant background are those born abroad, or whose parents were born abroad.
Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

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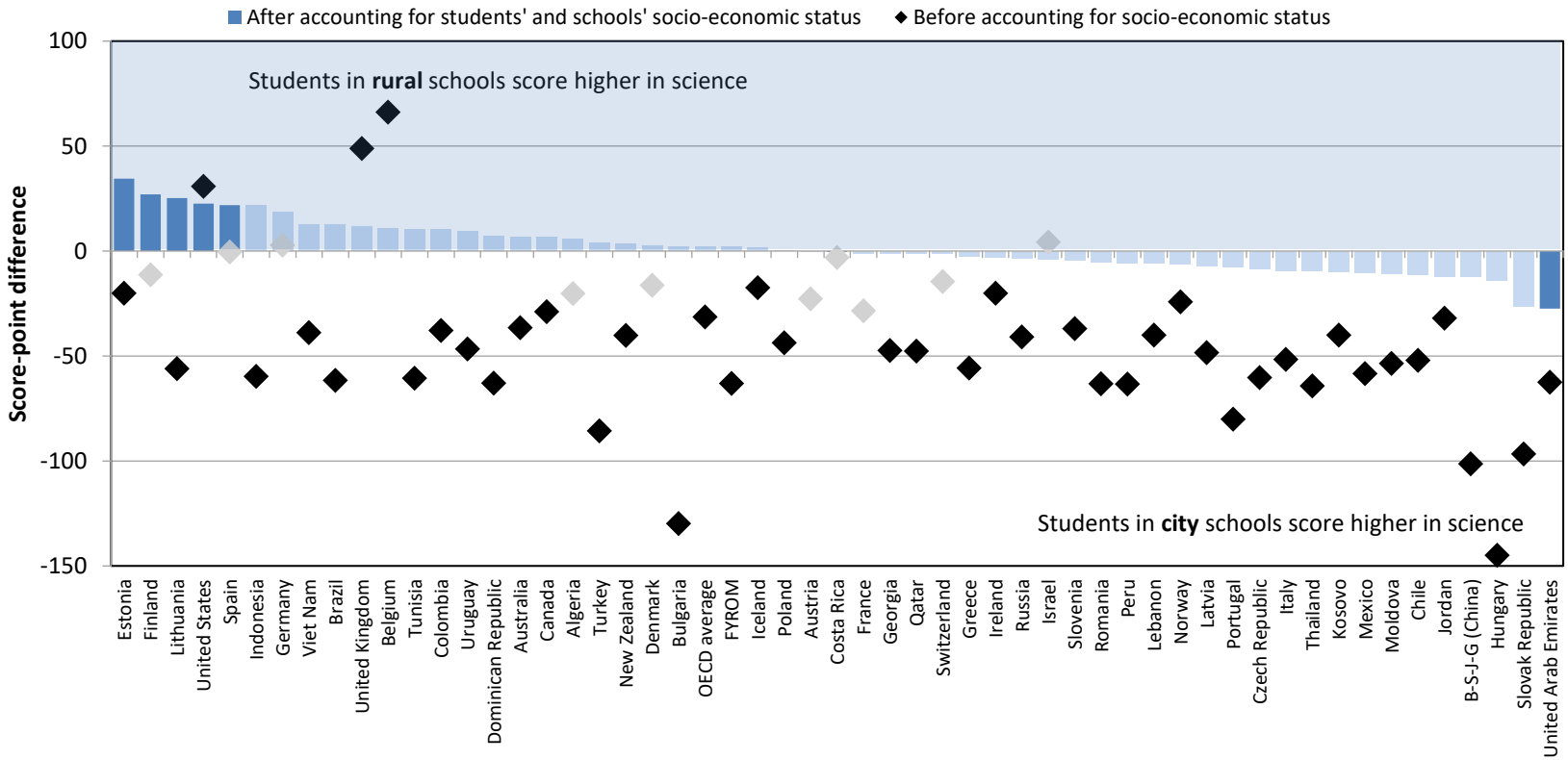
3. How well do rural students do?

PISA 2015 data show that, on average across OECD countries, students in city schools score 31 score points higher in science than students in rural schools, which is roughly equivalent to one year of schooling (Figure 7). In Bulgaria, Beijing-Shanghai-Jiangsu-Guangdong (People's Republic of China) [hereafter "B-S-J-G (China)"], Hungary, Portugal, the Slovak Republic and Turkey, the rural gap is of at least 80 score points before accounting for socio-economic status. However, in Belgium, the United Kingdom and the United States, students in rural school outperform those in city schools. There is no difference in several countries, including Costa Rica, Germany, Israel and Spain.

The rural gap is even more visible in students' transitions to higher levels of education and in the educational expectations that precede their decisions to remain in the education system (Ames and Rojas, 2010[41]; Fleming and Grace, 2017[42]; Rosvall, Rönnlund and Johansson, 2018[43]; Zarifa, Hango and Pizarro Milian, 2018[44]). PISA 2015 shows that, on average across OECD countries, approximately half of students in city schools expect to complete at least a university degree (ISCED 1997 level 5A and 6), compared to only 30% of students in rural schools (OECD, 2017[45]). Across OECD countries, the rural gap in educational expectations, before accounting for socio-economic status, is largest in Hungary, Italy, Portugal, the Slovak Republic and Turkey (Figure 8).

Even rural students in the United Kingdom and the United States, who outperform their urban peers academically, are not more likely to expect completing a university degree than their urban counterparts. This finding is confirmed for the United States by several studies that report a rural gap in the enrolment and completion of postsecondary education (McDonough, Gildersleeve and Jarsky, 2010[46]; USDA, 2017[47]; Koricich, Chen and Hughes, 2018[48]). In the European Union, rural areas consistently have the lowest level of tertiary attainment, and gaps between rural and urban areas have been growing over time (Eurostat, 2017[49]).

Figure 7. The rural-urban gap in science performance



Notes: Results based on linear regression models.
Statistically significant coefficients are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

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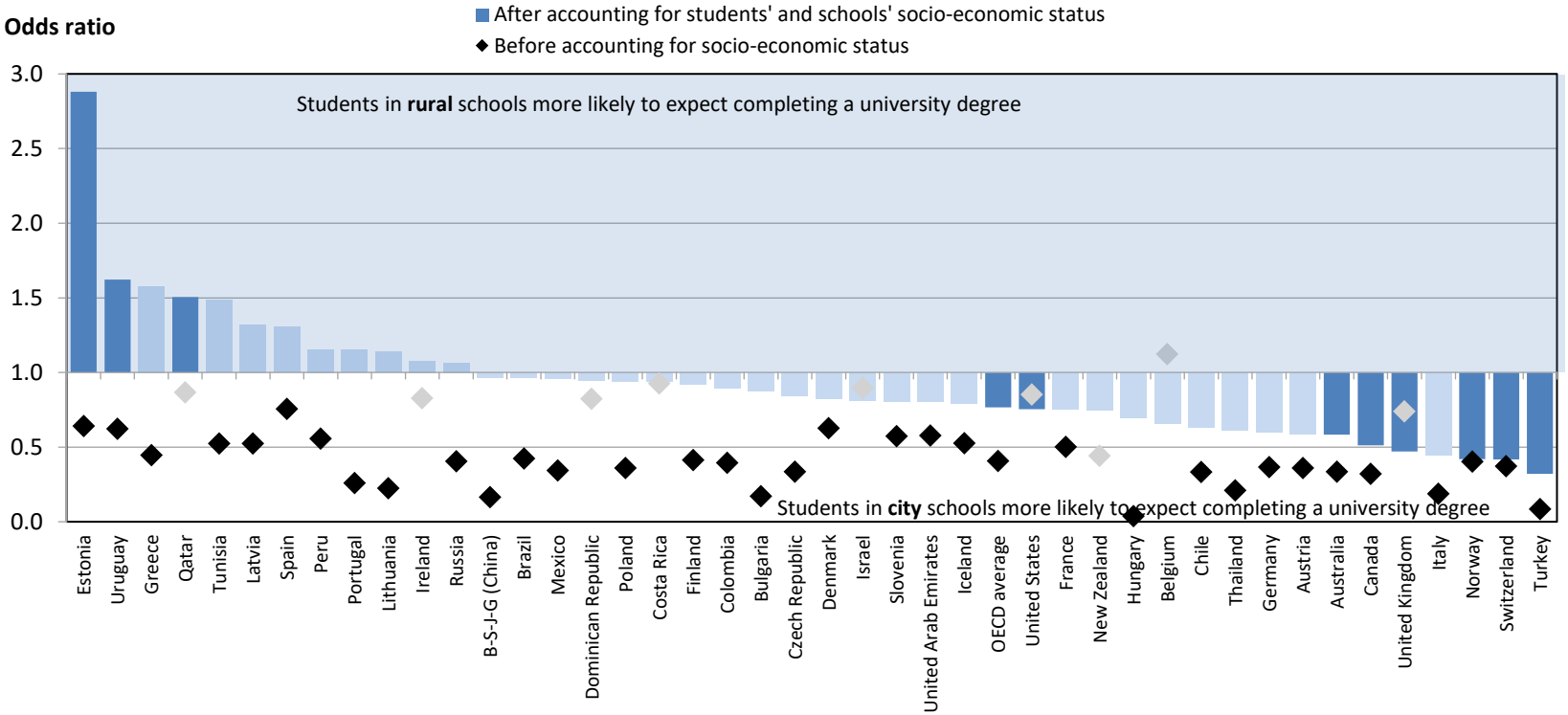
Figure 8. The rural-urban gap in educational expectations



Notes: Results based on logistic regression models.
Statistically significant odds ratios are marked in a darker tone.
The odds ratio is a measure of the relative likelihood of a particular outcome across two groups. An odds ratio below one denotes a negative association; an odds ratio above one indicates a positive association; and an odds ratio of one means that there is no association.
Only countries that distributed the computer-based questionnaires are shown.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

As some studies indicate, rural students frequently face a number of challenges in their transition to and completion of secondary education. Studies from Norway and the United Kingdom, for instance, found that distance and travel time can have a negative effect on participation in and graduation from upper secondary education, particularly for students with marginal performance and disadvantaged students (Dickerson and McIntosh, 2013[50]; Falch, Lujala and Strøm, 2013[51]). A qualitative study carried out in Chile found that rural students and their families lacked guidance and information for the transition to upper secondary education, and required specific socio-emotional support to support their education away from home (Hernández and Raczynski, 2014[52]). A study from the United States showed that rural adolescents experienced both positive and negative changes in terms of affective and behavioural outcomes. While their experience is similar to that of urban youth, it was qualitatively different to suburban youth to the extent that rural adolescents were more likely to lack role models, school resources and self-esteem (Witherspoon and Ennett, 2011[53]).

Studies from the United States suggest that rural students lag behind urban students mainly due to their lower socio-economic profile (e.g. Byun, Meece and Irvin (2012[54])). PISA 2015 data show that this is also true from a comparative perspective. On average across OECD countries, the academic performance gap between rural and urban students disappears completely after accounting for students' and schools' socio-economic profile (Figure 7). In Estonia, Finland, Lithuania, Spain and the United States, rural students would actually outperform students in urban areas if they, and their schools, had the same socio-economic profile.

The rural gap in students' expectations of completing a university degree is also to some extent explained by students' lower socio-economic status (Figure 8), and decreases substantially after accounting for socio-economic status, on average across OECD countries. The rural gap, measured in odds ratio, decreases almost 70% after accounting for students' and schools' socio-economic profile. However, the rural gap persists suggesting that other aspects of rurality, such as geographical barriers and a lack of career role models and highly-skilled jobs in their home villages, may also play a role (Bauch, 2001[30]; Alpe, 2012[55]).

Different settings and the opportunities they provide may influence students' motivations and choices. While cities tend to have more diversified labour markets and often concentrate universities and other tertiary institutions that provide opportunities to acquire the required qualifications, labour markets in rural areas tend to require less sophisticated skills. Moreover, the levels of educational attainment are typically lower among parents of children in rural areas, which can influence the nature of their involvement in school matters, the extent to which they can assist their children in navigating the education system and their children's career aspirations. Even when they are prepared to undertake further studies, rural students face particular barriers to fulfil their dreams and aspirations. They often need to commute long distances, or migrate to larger municipalities, to pursue a further education that is not necessarily required to obtain a job in their home villages (Irvin et al., 2011[56]).

Despite the challenges facing rural schools, some studies argue that small and rural schools can be particularly beneficial to socio-economically disadvantaged students (Howley, 1996[57]; Bauch, 2001[30]; Semke and Sheridan, 2012[58]). Nonetheless, PISA 2015 data reveal that the share of resilient students – those who despite coming from a disadvantaged background exhibit a high academic performance – is somewhat higher in city than in rural schools, on average across OECD countries (Figure 9). Only in Finland,

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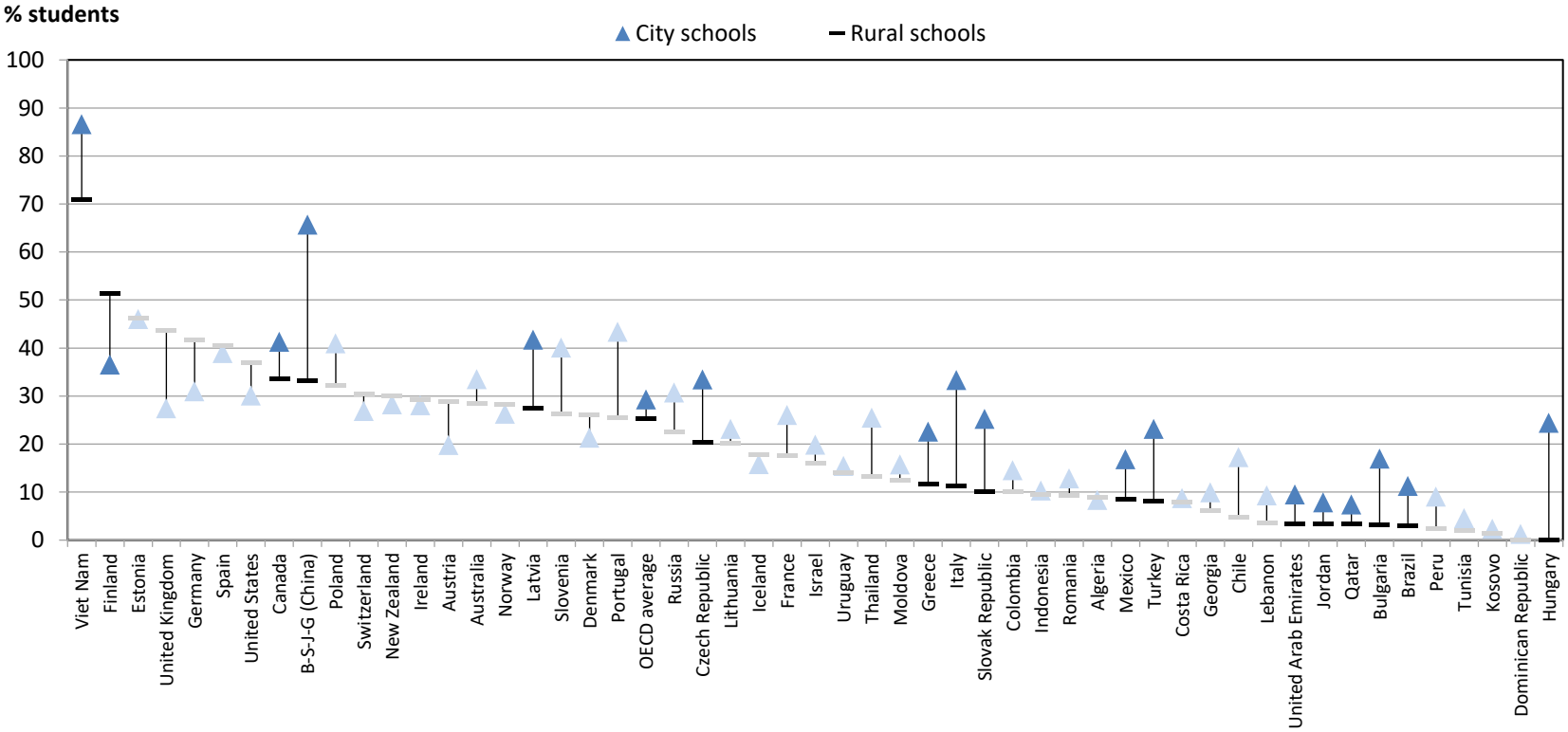
socio-economically disadvantaged students in rural schools are more likely to overcome their socio-economic circumstances than their urban peers. Rates of grade repetition also tend to be particularly high in rural schools: on average across OECD countries, students in rural schools are almost twice as likely to have repeated a grade as students in city schools (OECD, 2016[24]).

In terms of school climate and well-being, students in rural schools were somewhat more likely to report being a victim of bullying than students in city schools, on average across OECD countries (Figure 10). For instance, about 15% of students in rural schools reported that they got hit or pushed around by other students, compared to 11% of students in city schools, and about 27% of students in rural schools reported that other students left them out of things on purpose, compared to 22% of students in city schools.

Figure 9. Share of resilient students, by school location



Notes: Students are classified as resilient if they are in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and perform in the top quarter of students among all countries/economies, after accounting for socio-economic status.
Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

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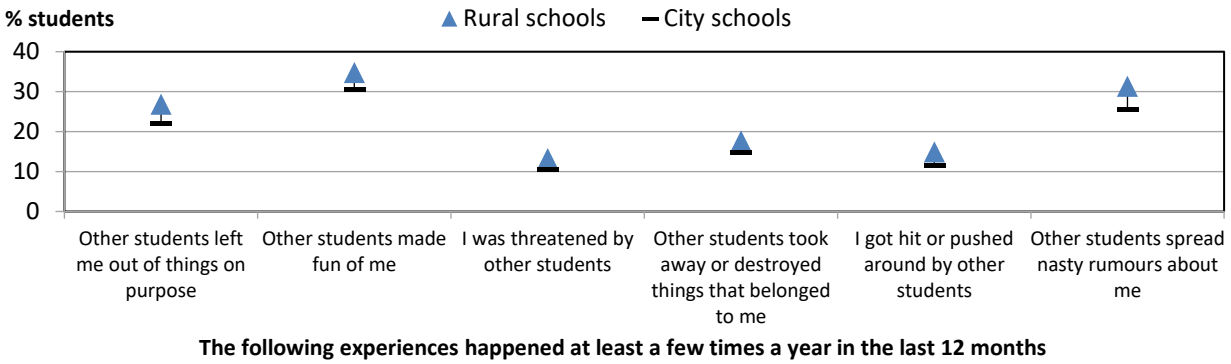
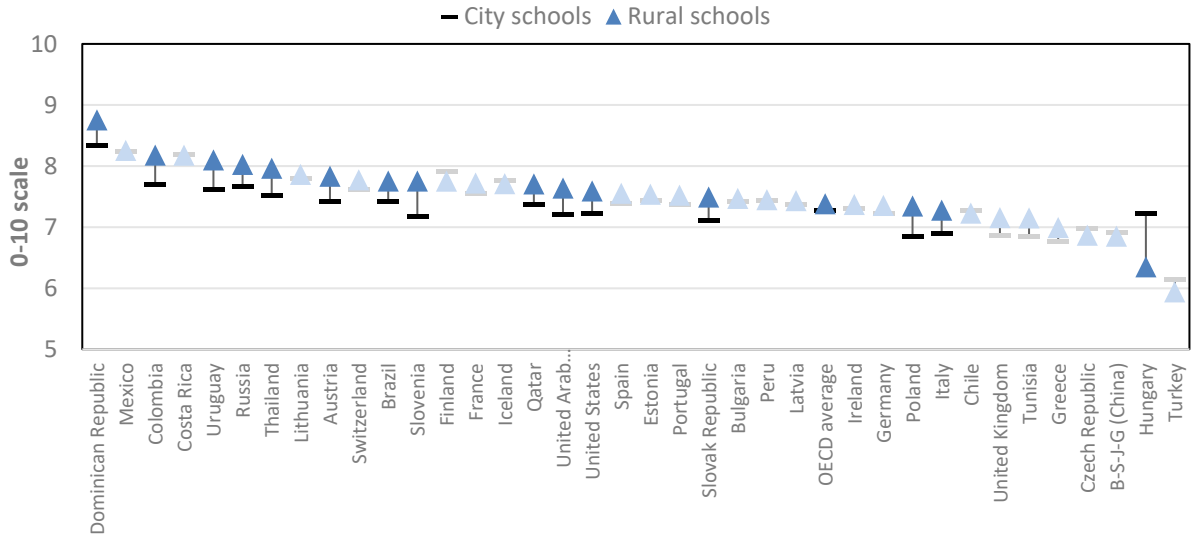
Figure 10. Bullying, by school location
OECD average, students' self-reports



Notes: All differences are statistically significant.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

Despite being more frequently bullied, students in rural schools reported somewhat higher levels of life satisfaction than students in city schools (Figure 11). In a scale that ranges from 0 (not at all satisfied) to 10 (completely satisfied), average life satisfaction among students in rural schools was 7.38, whereas that of students in city schools was 7.26, on average across OECD countries. The rural-urban gap, in favour of rural schools, was particularly large in Austria, Colombia, the Dominican Republic, Poland, Slovenia, Thailand, the United Arab Emirates and Uruguay.

Figure 11. Life satisfaction, by school location
Based on students' self-reports



Notes: Statistically significant differences are marked in a darker tone.
Only countries that distributed the computer-based questionnaires are shown.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

In countries like Australia, Canada, Chile and the United States, rural and remote communities are often home to many indigenous populations. Even though PISA does not identify these students, the high poverty rates and low academic achievement observed in many rural areas can have a disproportionate effect on the educational outcomes of children and young people from indigenous communities (Demmert, Grissmer and Towner, 2006[59]; Friesen and Krauth, 2010[60]; Logan and Burdick-Will, 2017[61]; Canales and Webb, 2018[62]).

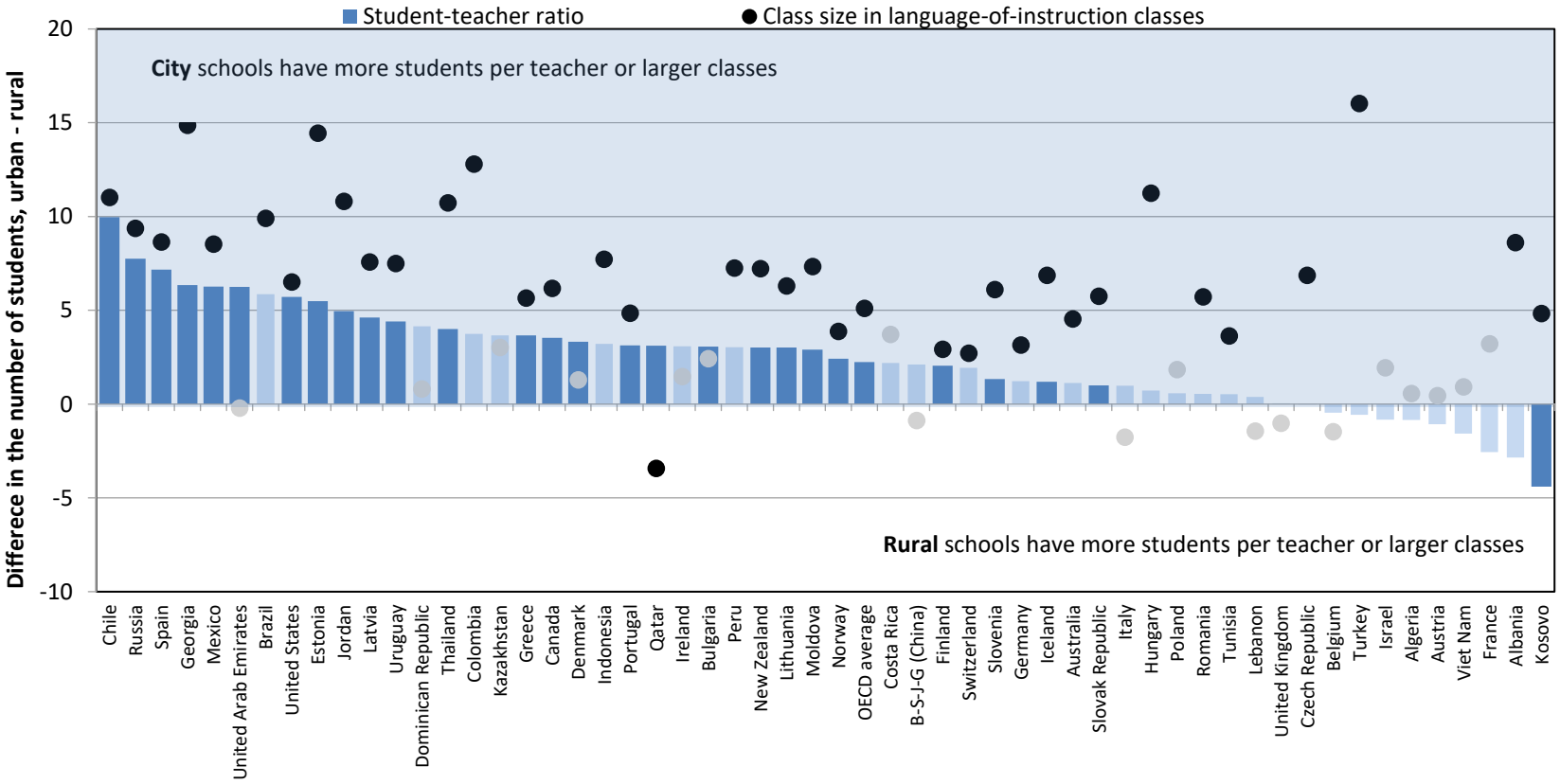
4. Issues shaping the learning experience of rural students

Rural schools are often viewed from a negative perspective. Their geographic isolation, small size and socio-economic composition are believed to increase their chances of suffering from inadequate infrastructure, a lack of quality teachers, and limited educational offerings, among other challenges. However, as this section reveals, these problems are far from universal, and some of the characteristics of rural education, such as their low student-teacher ratios, the abundance of social capital and the emergence of new technologies, open real opportunities for rural schools. In Chile, for instance, the initiative *Puentes Educativos* seeks to exploit the potential of multigrade teaching in rural schools for developing students' competencies like creativity, collaboration and critical thinking through changes in rural teachers' educational practices, curriculum, and educational materials (Puentes Educativos, 2018[63]). Also several "urban" initiatives, such as alternative models based on small schools, multigrade teaching, moderate student-teacher ratios and close home-school relationships, point to the potential benefits that rural communities provide (Ares Abalde, 2014[1]; Smit, Hyry-Beihammer and Raggl, 2015[64]).

4.1. Teaching and learning environment

Some of the most frequently cited features of rural education are the small size of schools and classrooms, and the low student-teacher ratios. Even in secondary education, rural schools and classrooms are typically smaller than urban ones, and there are fewer students per teacher, as PISA 2015 data illustrate (OECD, 2016[24]). On average across OECD countries, rural schools have, compared to city schools, five fewer students in language-of-instruction classes and two fewer students per teacher (Figure 12). In no education system do rural schools have larger classrooms or higher student-teacher ratios. The largest differences in student-teacher ratios are observed in Chile, the Russian Federation (hereafter "Russia") and in Spain, and for the average class size in the language of instruction in Estonia, Georgia and Turkey.

Figure 12. The rural-urban gap in student-teacher ratio and class size



Notes: Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database, Tables II.6.29 and Table II.6.30 (http://www.oecd.org/pisa/data/2015database/).

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Limited enrolments may be challenging from a financial perspective and also require particular pedagogical strategies as discussed further below (e.g. effective multigrade teaching) (Egelund and Laustsen, 2006[3]; Ares Abalde, 2014[1]). But it also creates opportunities for schools and families, for instance in terms of teacher support and adaptive teaching, especially for disadvantaged and struggling students (Duncombe and Yinger, 2007[65]; Konstantopoulos and Chung, 2009[66]; Gershenson and Langbein, 2015[67]). In the words of a teacher in a rural school: "We teach it and those who don't get it, we re-teach", or again "You can personalize it so it's meaningful and understandable for them" (Eppley, 2015[68]). Small schools and the perceived benefits, such as safety and a good school climate, may also attract teachers to work in rural contexts (Downes and Roberts, 2018[69]).

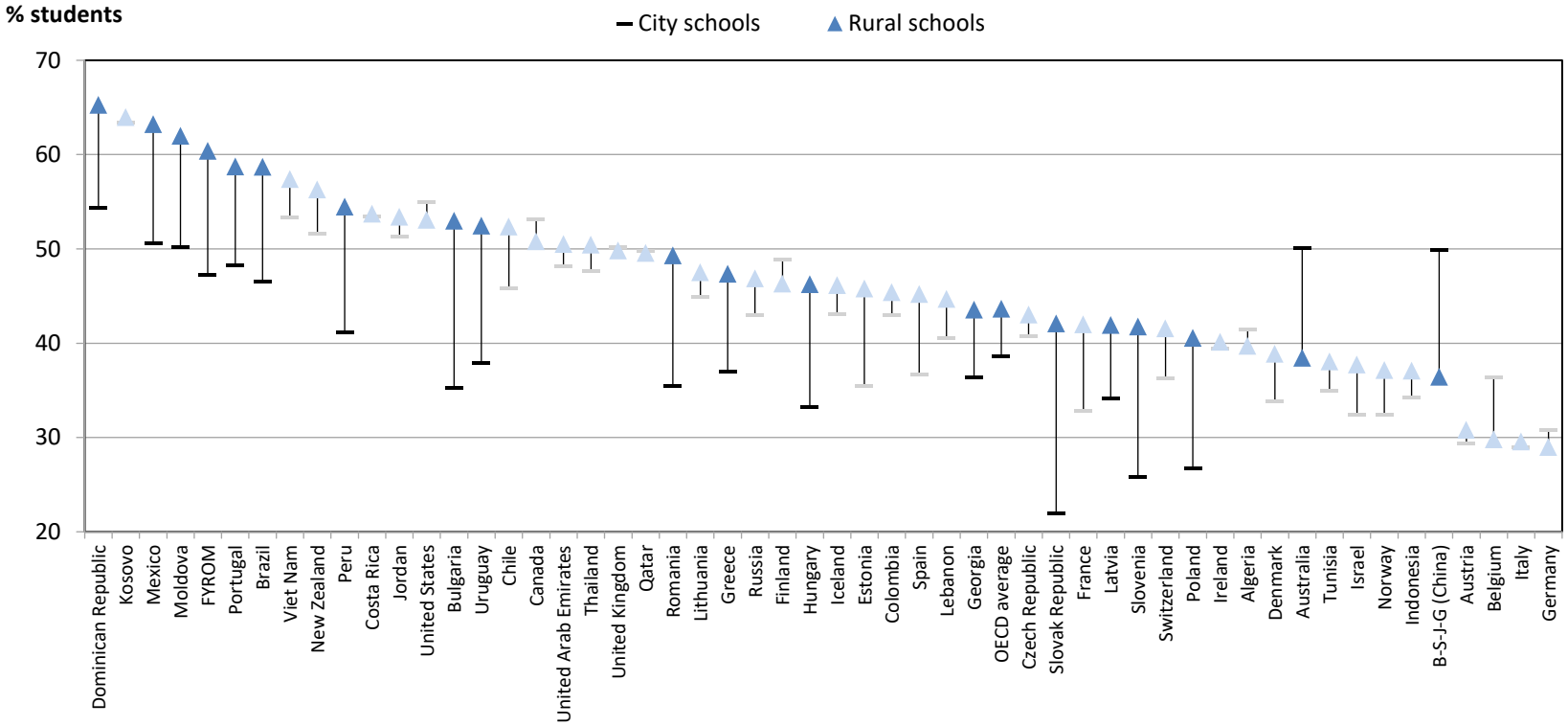
The potential of small classes for creating a supportive learning environment is visible in PISA 2015 data: on average across OECD countries, and according to students' reports, science teachers with smaller class sizes are more likely to adapt their lessons to the needs and knowledge of their students than science teachers in schools with larger class sizes (OECD, 2016[24]). In addition, in almost every OECD country, students whose science teachers adapt more frequently their teaching outperform academically students whose teachers adapt their teaching less frequently, even after accounting for students' and schools' socio-economic profile (OECD, 2016[24]).

On average across OECD countries, teachers in rural schools tend to be more supportive than teachers in city schools (OECD, 2016[24]). For instance, in the Slovak Republic about 42% of students in rural schools reported that their science teacher gives extra help when students need it in every lesson, compared to 22% of students in city schools (Figure 13). On average across OECD countries, students whose teachers are more supportive score slightly higher in science than students whose teachers are less supportive, after accounting for students' and schools' socio-economic status (OECD, 2016[24]).

Small schools are often perceived as enjoying a better disciplinary climate than large urban schools (Kearney, 1994[70]; Provasnik et al., 2007[71]). This vision is partly confirmed with PISA 2015 data: on average across OECD countries, 26% of rural students are enrolled in schools where the principal reported that students skipping classes hinders student learning, compared to about 36% of urban students (Figure 14). Similarly, 42% of students in rural schools reported arriving late for classes at least once in the two weeks prior to the PISA assessment, compared to 48% of students in city schools (OECD, 2016[24]). In other areas, however, there are no significant differences between rural and city schools, including students' reports on skipping school (OECD, 2016[24]).

Figure 13. Teacher support in science lessons, by school location

Share of students who reported that the science teacher gives extra help when students need it in every lesson



Notes: Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

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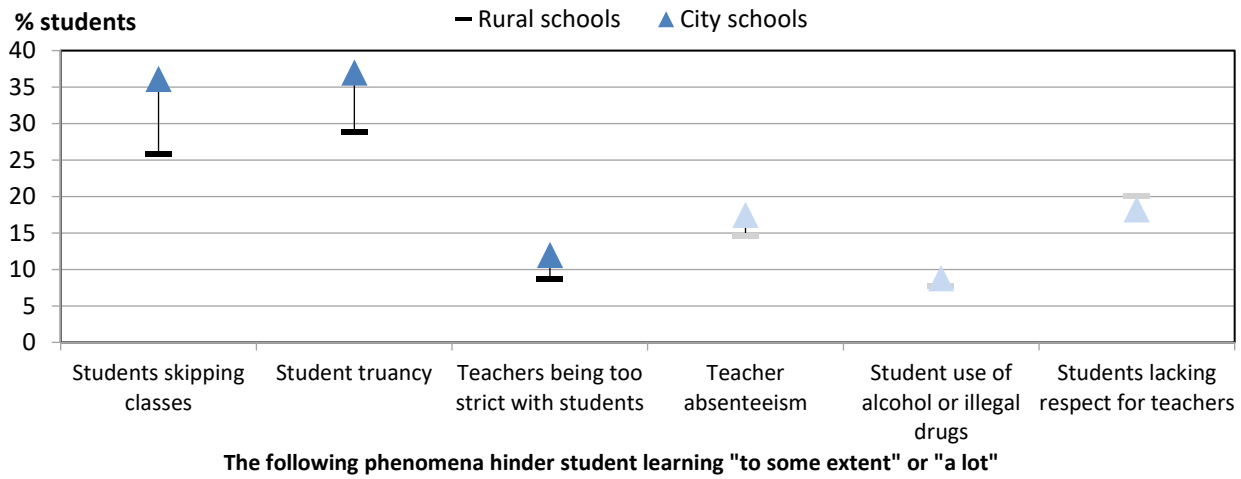
Figure 14. Student- and teacher-behaviour hindering learning, by school location

OECD average, school principals' reports



Notes: Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

4.2. Financial and material resources

The small size of rural communities makes the provision of education much more expensive per capita than in cities and implies high fixed costs to maintain small schools with low student-teacher ratios. Especially single teacher schools with few students per teacher and building can be significantly more expensive on a per-student basis. School funding systems may also put rural schools at a disadvantage. Allocations for current expenditure that are primarily based on student enrolment often do not sufficiently reflect the higher costs of delivering comparable programmes and services in low density and remote environments (OECD, 2017[72]). While the cost structures between rural and urban schools may be similar, funding levels may have to be different (Imazeki and Reschovsky, 2003[73]). Funding mechanisms may entail cost adjustments, but these may underestimate the actual influence of factors, such as poverty, on costs in rural areas (Baker and Duncombe, 2004[74]; Sielke, 2004[75]). In some systems, school funding by local authorities is highly dependent on the local tax base, which may also put rural communities with fewer resources at a disadvantage.

The small size of rural schools furthermore means that budgets are less stable and predictable, and that changes in enrolment will lead to great changes in costs per student. Rural schools and authorities face considerable fiscal pressures to avoid school closures when enrolments decline (Mathis, 2003[76]; Showalter et al., 2017[9]). Also investments in infrastructure and maintenance may be more difficult for small rural communities where such funds are distributed on a competitive basis (OECD, 2018[2]). At the same time, the higher per-student cost in rural areas might direct resources away from other priorities, such as investing in urban schools which typically face their own set of equity challenges (OECD, 2017[72]; OECD, 2018[2]).

One could then expect differences in the material resources available to rural schools. However, according to principals' reports rural schools are similarly equipped to city schools in most OECD countries (Figure 15). In Austria, Finland and Israel, for instance, no differences are reported between rural and city schools in any of the material resources examined. In several countries, such as Belgium, Canada, Denmark, Germany, Hungary, Iceland, Latvia and Slovenia, rural schools are, overall, better equipped than city schools, according to school principals.

This contrasts with the situation in Australia, Ireland and Norway, and particularly in Mexico, where principals in rural schools are considerably more concerned about the material resources than principals in city schools. It also contrasts with most lower- and upper-middle-income countries that participated in PISA 2015, such as Albania, Algeria, B-S-J-G (China), the Dominican Republic, Georgia, Indonesia, Jordan, Lebanon, Peru, Thailand and Viet Nam. Here, principals in rural schools are significantly more concerned about the material resources than principals in urban schools.

The largest gap, in favour of city schools, is observed in science-specific resources. On average across OECD countries, and in 29 PISA-participating countries, the science department in city schools is better equipped than in rural schools, according to school principals (Figure 15). On the other hand, the largest gap, in favour of rural schools, is observed in the number of computers per student. On average across OECD countries and in about a third of countries there are more computers per student in rural than in city schools, which could partly reflect their inability to benefit from economies of scale. However, rural schools have often fewer computers connected to the Internet (OECD, 2016[24]). In Mexico, for instance, only 42% of computers in rural schools are connected to the Internet, compared to 90% of computers in city schools.

Figure 15. The rural-urban gap in schools' material resources

Based on school principals' reports

Rural schools **better** equipped than **city** schools

No statistically-significant difference

City schools **better** equipped than **rural** schools

Notes: Countries are ranked in descending order of the total number of significant gaps (+ rural; - urban).
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
(1) Share of students in schools where the principal considered that the following issues hindered, "to some extent" or "a lot", the capacity of the school to provide instruction.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

4.3. School choice

A lack of a critical mass of students (and teachers and other staff) together with limited budgets and sparse populations often means that many rural families have a limited choice of schools, education programmes, after-school activities, and access to additional support. One of the goals of many school network reorganisation efforts is precisely to expand and improve the instructional programmes, course offerings and extracurricular activities on offer for rural students by increasing the size of the school (Rogers, Glesner and Meyers, 2014[77]). The lack of critical mass is only aggravated by demographic changes in rural areas in most OECD countries (Figure 3) and by the fact that some rural families "by-pass" their local school to enrol their children in larger schools in neighbouring communities.

Where parents can choose their children's school, rural families often have very limited choices. Many rural families have only one primary school to choose from in the community, and many secondary students need to commute on a daily basis, or may need to attend a boarding school. In PISA 2015, only 38% of rural families across the OECD reported that at least one other school competes in the area with their current school, compared to 71% of urban families (OECD, 2016[24]). Consolidating rural school networks and closing or merging rural schools may constrain parents' choices even further (Gronberg et al., 2015[78]).

A further sign of the limited choices of parents in rural areas is the relatively small percentage of 15-year-olds in rural schools attending a private school, compared to 15-year-olds in urban schools (OECD, 2016[24]). In Spain, for instance, only 4% of students in rural schools attend a private school, compared to 53% of students in city schools. Other countries with large rural-urban differences in the attendance at private schools include Australia, Chile, Colombia, Costa Rica, the Dominican Republic, Ireland, Peru, Qatar, Spain, the United Arab Emirates and Uruguay.

4.4. Early childhood education and care

Early childhood education and care, which has been shown to improve the opportunities of disadvantaged children (Elango et al., 2015[79]), is another instance where rural families may have fewer opportunities than urban families. Data from PISA 2015 provide insights on the length over which 15-year-olds have attended pre-primary education, suggesting that differences between urban and rural areas are moderate on average. On average across OECD countries, 15-year-old students in rural schools spent an average of 2.9 years in pre-primary education, whereas their urban counterparts had done so for 3.1 years (OECD, 2016[24]). However, the rural gap in pre-school attendance is fairly large in some OECD countries, such as Estonia, Finland, Ireland, Latvia, Portugal, the Slovak Republic and Slovenia, and even larger in several lower- and upper-middle income countries, including B-S-J-G (China), the Dominican Republic, Lithuania, Russia, Tunisia and Uruguay.

Lower coverage in rural areas can be related to a number of factors on the supply and demand side, such as provision at reasonable distance and cost, and occupational patterns and family structures. In a study of pre-primary education in rural municipalities in Chile, large distances and great dispersion were found to hinder access, while difficulties to attract staff and limited opportunities to acquire qualifications as early childhood educators affect quality of provision (Pineda, 2013[80]).

4.5. Educational programmes, specialised support and after-school activities

Students in rural schools may also have fewer options when it comes to choosing a wide range of education courses and programmes, particularly in secondary education, which may affect their achievement and options for further study (Ballou and Podgursky, 1995[81]). Schools may not have the teachers with the required expertise to teach specialised courses, such as advanced mathematics, or not have enough students that are adequately prepared for or interested in taking such courses (Irvin et al., 2017[82]). Evidence, however, also shows that the quality of the curriculum is not necessarily better in larger schools, at least after a certain size threshold is reached (Corbett and Mulcahy, 2006[83]), and that a greater curricular diversity does not improve the academic performance of all students (Nguyen, Schmidt and Murray, 2007[84]; Slate and Jones, 2005[85]).

The economic reliance of rural communities on few economic activities, typically agriculture, natural resources and tourism, together with limited staff resources, means rural schools may not be able to offer a broad range of work-study programmes that meets the interests of their students. Resource constraints may also mean that vocational programmes, which may require specific equipment and materials, may be more difficult to operate in rural contexts (OECD, 2018[2]). On the other hand, proximity between the school and the community may offer opportunities to connect student learning with the local context and the world of work (Schafft, 2016[86]). Rural students can naturally engage in authentic learning – using the local community as a learning laboratory (Bauch, 2001[30]) – by proposing meaningful activities that can improve the concrete challenges of their local communities (Kalaoja, 2001[87]), many of which are struggling with the delivery of services (OECD, 2010[17]).

Small rural schools may not only struggle to offer academic depth and breadth, but also to provide additional support and supplementary services, including for particular groups of students. For instance, rural schools may face particular challenges to create inclusive learning environments for students with special needs. While rural schools tend to have fewer space constraints than urban and suburban schools, they often face challenges when trying to find and retain the necessary specialised staff or to get support from external service providers due to their location. A small number of educators may have to work with a wide range of abilities and disabilities beyond their area of expertise (Berry et al., 2011[88]; Sipple and Brent, 2015[89]), and parents may see the need to complement regular instruction with home-schooling (Schafer and Khan, 2016[90]).

Academically gifted students too, particularly in small and remote areas, may not always have the same subject choice and learning opportunities that are available in urban schools (Puryear and Kettler, 2017[91]). While the small size of rural schools and classrooms provides good conditions for teachers to identify students' exceptional talents, attitudes and biases may work against the identification of gifted students, including among disadvantaged and minority groups (Lawrence, 2009[92]). Similarly, remedial classes, language instruction and psycho-emotional support may be difficult to organise for recently arrived migrant children. Rural schools, which may be unaccustomed to working with diverse learners, may not have the required staff or professional development opportunities (Johnson and Strange, 2005[93]).

Schools are also places where students develop many of the social and emotional skills they need to lead a happy and fulfilling life. Rural schools may, however, face particular barriers in providing opportunities for broader student development and in supporting well-being. For example, the design and implementation of strategies for school-based mental health

prevention and intervention may be influenced by limited access to school-based and community-based resources (e.g. counsellors, psychologists, social workers), little knowledge of innovative models (e.g. evidence-based practices and data-based decision-making), and a lack of awareness and support in the local community (e.g. social stigma towards seeking help) (O'Malley, Wendt and Pate, 2018[94]).

Extracurricular activities, such as sports, music and academic activities, can also improve students' cognitive and cognitive skills, such as persistence, independence and teamwork (Farb and Matjasko, 2012[95]; Howie et al., 2010[96]; Ludden, 2010[97]). Rural schools, however, can again not benefit from the economies of agglomeration and community resources in the same way as their urban counterparts do, often limiting their offer of after-school activities. Some children may be able to attend some of these activities, such as science clubs, cultural events and sport activities, in neighbouring urban centres, but at a considerable logistical, time and financial cost for parents and children. In one study conducted in the United States, for instance, many students who were transferred to a larger school following a school closure cited the expansion of after-school activities as the main, and sometimes the only, advantage of their school transfer (Delp, 2015[98]).

Even in secondary education, where schools tend to be larger, students in rural schools are not exposed to the same extracurricular opportunities as their urban peers. On average across OECD countries, for instance, 29% of 15-year-old students enrolled in rural schools are offered a science club as a school activity, compared to 41% of students enrolled in urban schools (OECD, 2016[24]). Students in rural schools are also offered, on average across OECD countries, one extracurricular activity less at school – out of a list of ten possible activities related to arts, culture, science and sports – than students in urban schools (Figure 16). On the other hand, after-school activities in smaller schools may have their own advantages: some studies argue that after-school activities in larger schools are often overcrowded and not all students will be able to participate on an equal basis (Leithwood and Jantzi, 2009[99]; Slate and Jones, 2005[85]).

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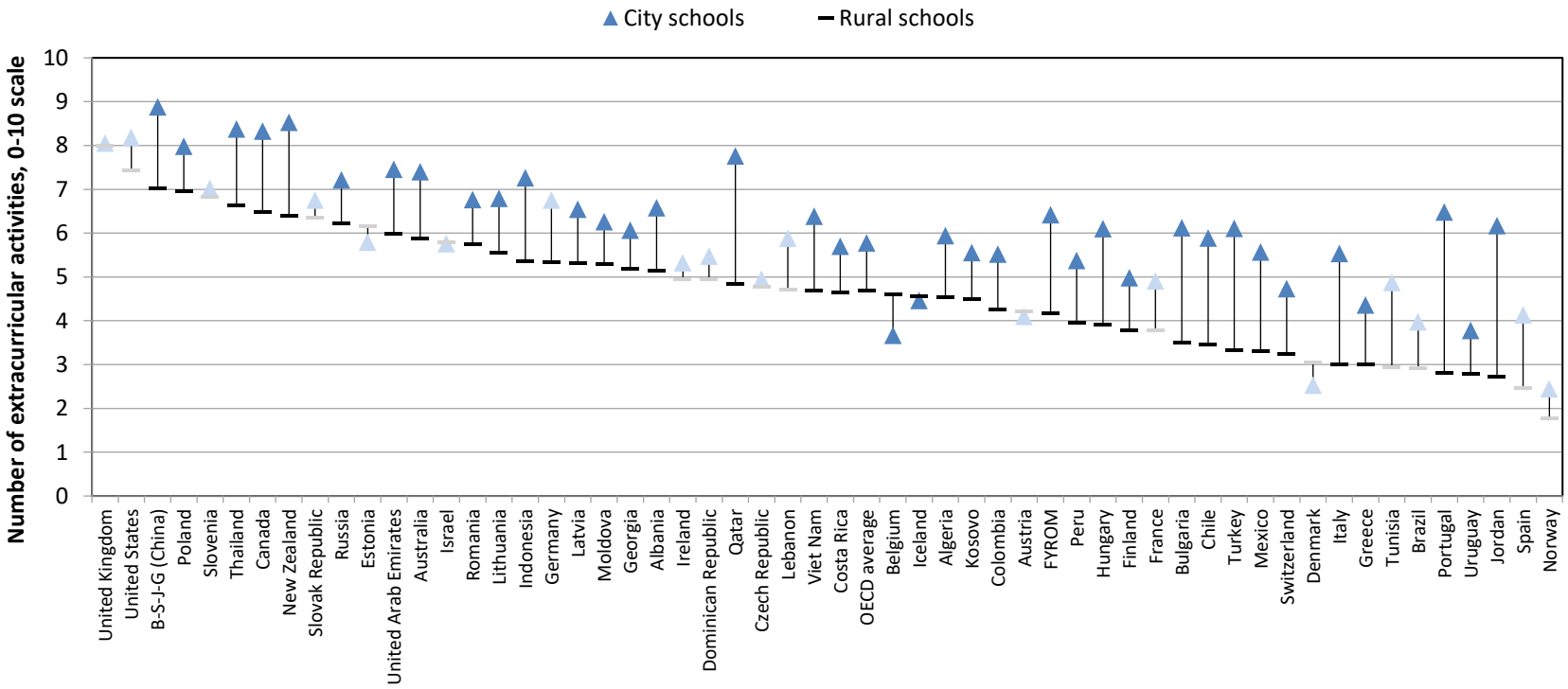
Figure 16. Extracurricular activities offered at school, by school location

Based on school principals' reports



Notes: School principals were asked about the following activities: Band, orchestra or choir; School play or school musical; School yearbook, newspaper or magazine; Volunteering or service activities; Science club; Science competitions; Chess club; Club with a focus on Information and Communication Technology (ICT); Art club/activities; and Sporting team/activities.
Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

4.6. Staffing schools with quality teachers

Ensuring that the best educators work with students in challenging schools who would benefit the most from high-quality teaching is difficult in many countries (OECD, 2018[100]). Schools' profiles influence the distribution of teachers and school leaders, and schools with more challenging working conditions often find it more difficult to retain effective staff (Guarino, Santibañez and Daley, 2006[101]; Loeb, Kalogrides and Horng, 2010[102]; Johnson, Kraft and Papay, 2012[103]; Goldhaber, Lavery and Theobald, 2015[104]). The location of a school is one of the factors that influence the distribution of staff with different levels of experience and qualifications. In the United States, for example, urban school districts serving disadvantaged populations face particular teacher shortages, although there is great variation between districts (Papay et al., 2017[105]).

Studies from Australia, Iceland and the United States suggest that some rural schools also suffer from a lack of qualified staff (Cowen et al., 2012[106]; Fowles et al., 2013[107]; Brasche and Harrington, 2012[108]; Beesley and Clark, 2015[109]; Downes and Roberts, 2018[69]). Shortages are particularly acute in certain subject areas and specialisations, such as science and special needs (Barter, 2008[110]; Monk, 2007[111]; Schulken, 2010[112]; Sigbórsson and Jónsdóttir, 2005[113]). This often results in a below-average share of experienced and highly-trained teachers (Monk, 2007[111]; Gagnon and Mattingly, 2012[114]), and curriculum areas being covered by one teacher and teachers with little subject-specific training.

PISA 2015 shows that, on average across OECD countries, rural science teachers are somewhat less likely to have completed a university degree with a major in science than urban science teachers (Figure 17). Data from TALIS 2013, too, reveal that rural teachers are somewhat less likely to have completed a university degree (OECD, 2014[23]). However, these differences are small, which probably explains why only in a handful of countries' principals in rural schools are more concerned about the teaching staff in their schools than principals in city schools (Figure 17). There are only seven countries and economies where principals in rural schools are more concerned about the lack of teaching staff than principals in city schools, and only 10 where they are more concerned about the quality of the teaching staff. The rural-urban gap in the quantity and quality of teaching staff is particularly large in Albania and Qatar.

TALIS 2013 data on lower secondary education reveal that, on average across OECD countries, teachers in urban schools are younger and more experienced than teachers in rural schools but the differences are, again, modest (Figure 18). Only in a few countries, including Australia, Brazil, Bulgaria, Croatia, Japan, Mexico, Romania, Serbia and Spain, are urban teachers considerably older and more experienced than rural teachers. Despite the multiple challenges faced by rural teachers that could potentially lead to a higher staff turnover, there is no clear evidence across countries that urban teachers in lower secondary education spend more years teaching in their schools than rural teachers, except in Croatia, Japan, Korea, Romania, Serbia and Spain.

Figure 17. The rural-urban gap in teaching staff

Based on school principals' reports

Rural schools **better** staffed than **city** schools

No statistically-significant difference

City schools **better** staffed than **rural** schools

Notes: Countries are ranked in descending order of the total number of significant gaps (+ rural; - urban). All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.

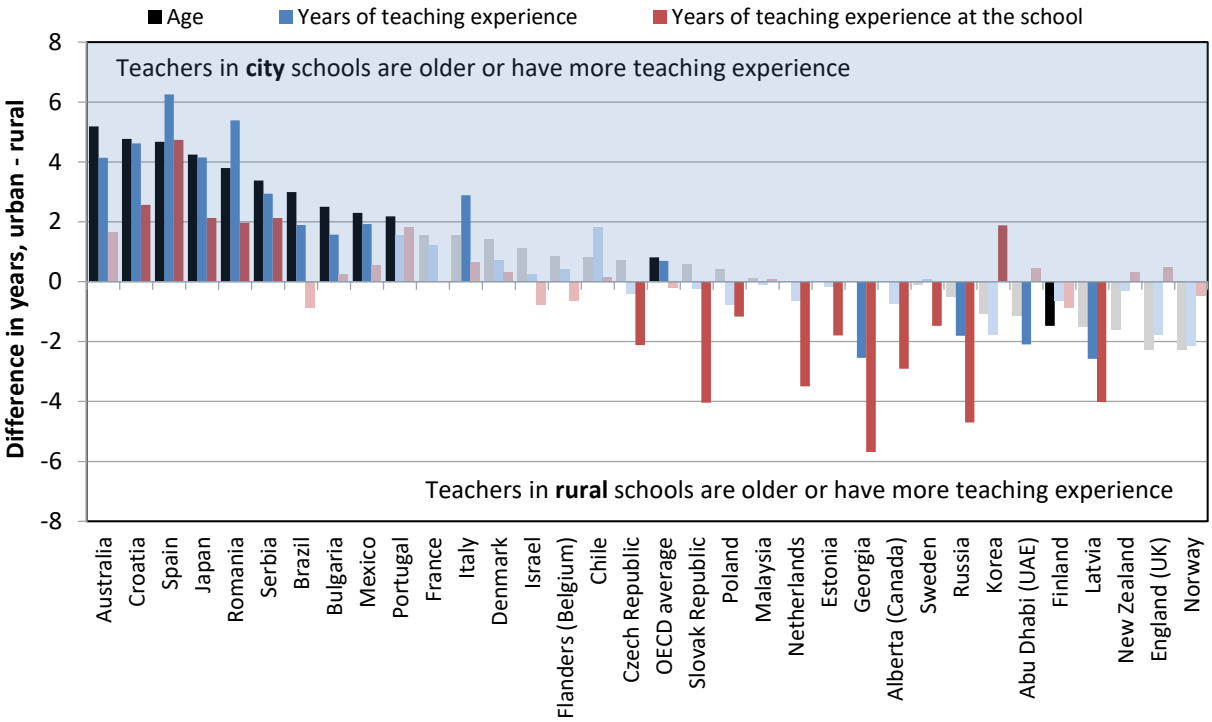
(1) Share of students in schools where the principal considers that the following issues hinder, "to some extent" or "a lot", the capacity of the school to provide instruction.

(2) Science teachers with a university degree and a major in science.

Source: OECD, PISA 2015 Database (http://www.oecd.org/pisa/data/2015database/).

Figure 18. The rural-urban gap in teachers' age and experience

Lower secondary education



Notes: Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, TALIS 2013 Database (http://www.oecd.org/education/school/talis-2013-results.htm).

4.7. Teacher preparation, learning and support

Even when rural schools are staffed with good teachers and school leaders, they may be unprepared for teaching and learning in rural contexts since initial teacher preparation programmes are mostly focused on practices pertaining to larger urban schools (Yarrow et al., 1999[115]; Ares Abalde, 2014[1]).

In rural primary schools, for instance, multigrade classrooms are commonplace. The small number of students and teachers in these schools shapes the ways in which schools can use the time of teachers and students, and how these are grouped by grades and abilities (Mulcahy, 2009[116]). Parents may be concerned about their children learning together with children of different ages in the same classroom (Cornish, 2006[117]), but research suggests that multigrade teaching is not necessarily less effective than in age-specific classes. While the results of earlier research was mixed and inconclusive (Veenman, 1995[118]; Mason and Burns, 1996[119]), more recent studies stress the heterogeneous effects of multigrade teaching depending on classroom composition, age and gender (Leuven and Rønning, 2016[120]; Quail and Smyth, 2014[121]). In any case, the outcomes of students learning in multigrade classrooms also depends on teachers' preparation and support to engage their students, manage classroom interaction and discipline, and prepare their classes (McEwan, 2008[122]; Mulryan-Kyne, 2007[123]).

Given the small number of staff, rural teachers may have to teach a variety of subjects, including some outside their area of expertise for which they have not received training and

for which they may require additional time to prepare (Barter, 2008[110]). Data from TALIS 2013, in fact, reveal that in several countries, and on average across OECD countries, a larger share of rural teachers than urban teachers reported that they did not receive formal education or training on the content, pedagogy or classroom practice for all the subjects they teach. In the Czech Republic, for instance, 61% of urban teachers reported having done a practicum or internship for all subjects they teach, compared to 36% of rural teachers (Figure 19). Teachers may also be unprepared to adapt lessons to the needs, knowledge and interests of rural students, for instance, by giving a rural "flavour" to the curriculum while preparing them for a globalised world and economy at the same time.

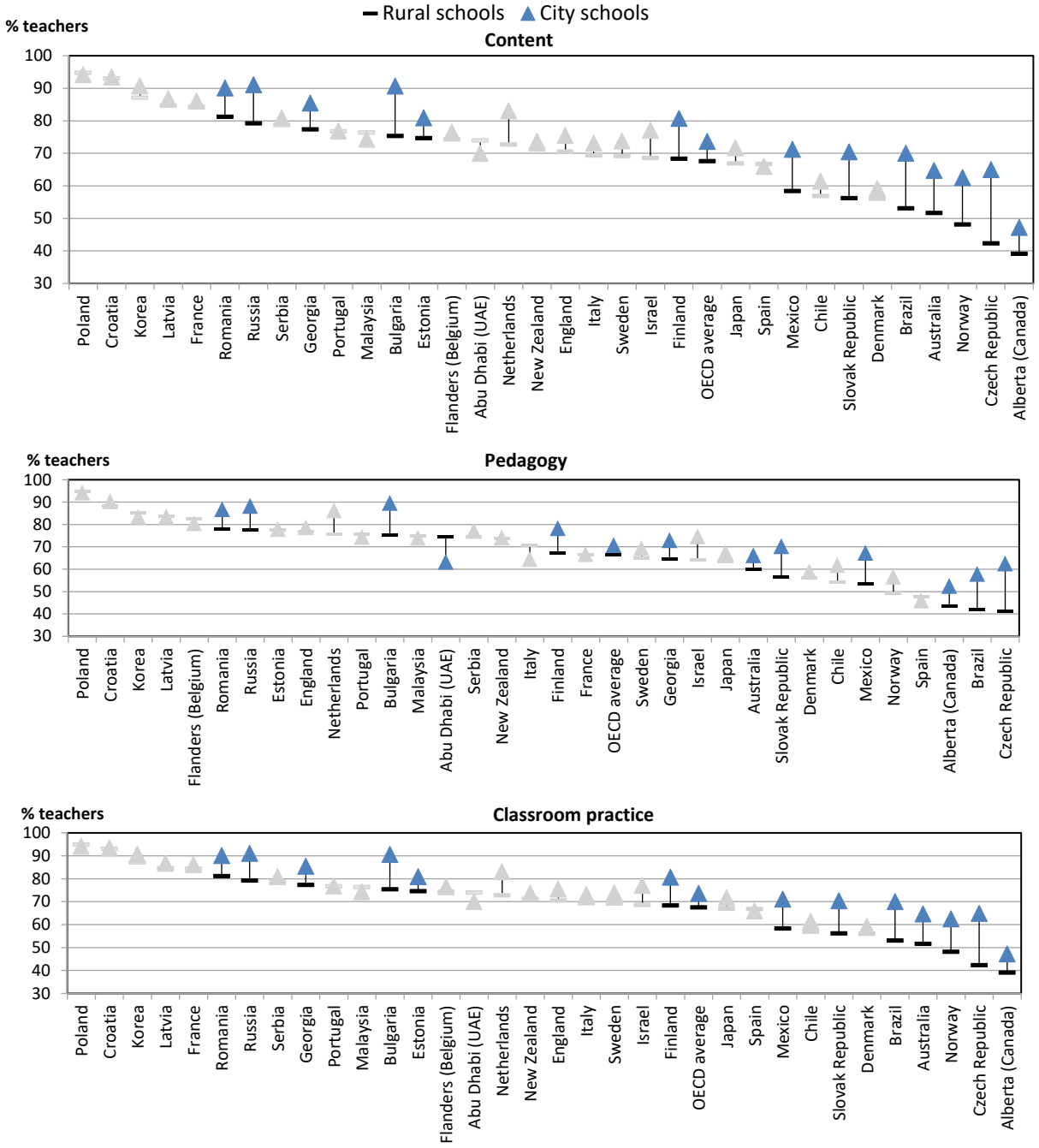
Some of these problems could be eased by the provision of appropriate professional development opportunities. However, several studies draw attention to the limited professional development opportunities for rural teachers, if only because training in more isolated areas is more costly to deliver (García Cantó et al., 2008[124]; OECD, 2010[17]). For instance, in the United States studies have found particular challenges in supporting rural teachers to adapt their practice to new learning standards. While all schools require support, time and resources to teach towards new standards and implement curricular guidelines, rural districts were found to have limited access to specialised expertise, such as curriculum specialists and instructional coaches. Attending workshops was reportedly often more difficult given long driving distances, and the necessity of staying overnight and finding substitute teachers (Timar and Carter, 2017[125]; Barrett-Tatum and M. Smith, 2017[126]).

Data from PISA 2015 suggest that difficulties to organise in-house professional development activities, such as inviting specialists, in rural schools are common across countries. Nevertheless, secondary teachers in rural and city schools overall participate to a similar extent in professional development, according to school principals in most school systems that participated in PISA 2015 (Figure 17). The professional development needs of rural and urban teachers however appear to differ in some respects. On average across OECD countries, teachers in rural schools are less likely than those in city schools to perceive that they need specific training in the area of multicultural and multilingual teaching (Figure 20). This likely reflects that rural schools tend to have a less diverse student body, and contrasts, for instance, with professional development needs in the area of Information and Communication Technology (ICT). In the latter area of competencies, a rural-urban gap is observed only in a handful of countries.

Nevertheless, rural teachers and leaders also need to develop an understanding of how to work with underrepresented or marginalised groups in rural areas, such as families from disadvantaged backgrounds or indigenous and ethnic minority students who may have less voice in the community (Jorgensen et al., 2010[127]; Biddle, Mette and Mercado, 2018[128]). Schools in rural areas can be challenging places also for sexual minority students in communities with more conservative values and beliefs, less anonymity and opportunities to identify with peers, and fewer community-based resources for support. Teachers and school staff need to be aware of the issues these students can face and how to support them (O'Connell et al., 2010[129]).

Figure 19. Content, pedagogy and classroom practice in formal education and training, by school location

Share of teachers who reported that content, pedagogy or classroom practice were covered during their formal education and training for all subjects they teach



Notes: Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, TALIS 2013 Database (http://www.oecd.org/education/school/talis-2013-results.htm).

School-based activities that are integrated into daily practice and involve co-learning among teachers have been recognised as particularly powerful forms of teacher development (Little, 2006[130]; Opfer and Pedder, 2011[131]). Opportunities to share ideas and collaborate with colleagues can however also be limited by the school size and geographical isolation of certain rural schools. This can result in some rural teachers feeling "professionally" isolated (Stern, 1994[132]). Teachers in rural schools may also have to spend a greater time on administrative tasks (Nitta, Holley and Wrobel, 2010[133]), which may limit the time they have to work with others.

4.8. School leadership

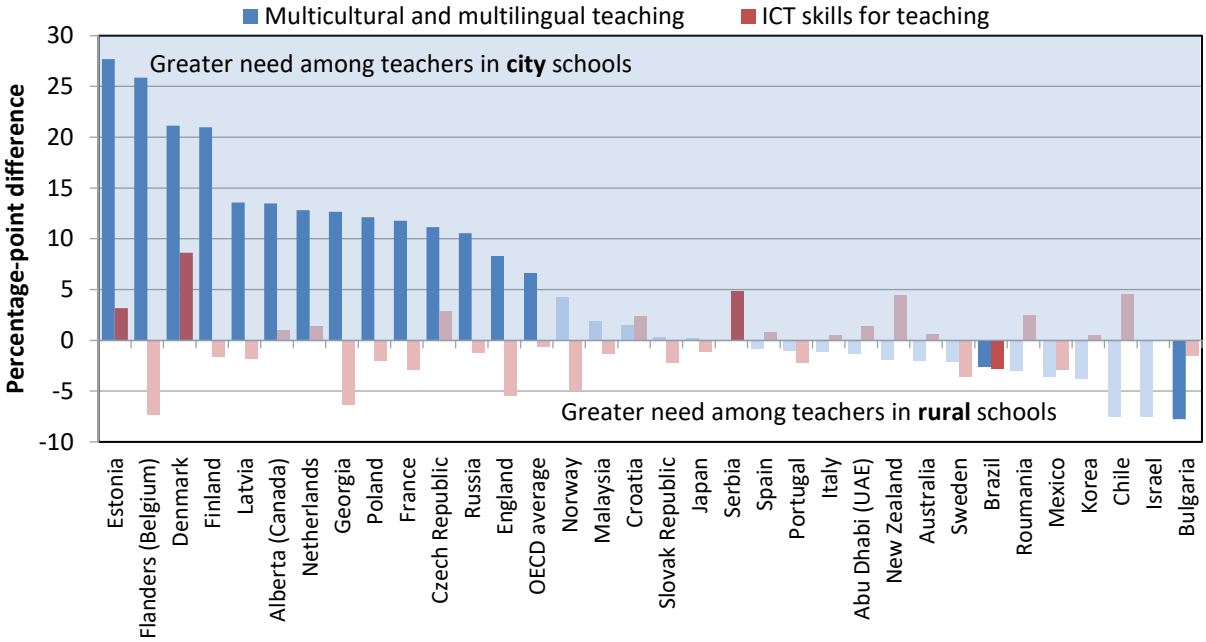
School leaders are key for building trusting and caring school cultures, promoting a sense of collective responsibility for student learning and development, and establishing structures and processes for shared decision-making and collaboration (Bellei et al., 2016[134]; Spillane et al., 2017[135]). Successful school leadership is always context-dependent and school leaders require awareness of the contexts in which they work and how to adjust their actions and practices accordingly (Hallinger and Heck, 1998[136]; Louis et al., 2010[137]). Rural contexts present their own challenges for school leadership. Some of these are similar to those of rural teachers and related to the small size of rural schools, such as the risk of professional isolation and limited access to professional learning. Others are particular to those in leadership positions (Hardwick-Franco, 2018[138]).

School leaders in general have to fulfil a wide range of tasks and responsibilities, and this is also the case in rural schools. Rural principals take on a diversity of roles, from classroom teaching, sometimes across multiple grades, to leading instruction and assessment in many subject areas, managing tight school budgets, fulfilling increasing central accountability and reporting requirements, and developing strong relations with close-knit communities. Rural principals may, however, have less administrative support in their responsibilities than their urban counterparts and receive less external supervision and feedback from education authorities. In some cases, rural principals manage not only one, but several schools or school sites (Preston, Jakubiec and Kooymans, 2013[139]). Reconciling central demands with local objectives can be a further challenge (Schafft and Biddle, 2013[140]).

At the same time, expectations of school leaders and public visibility and scrutiny can be particularly high in rural communities, and the effects of leadership may be felt more keenly in small schools. Implementing change and creating a culture of critical inquiry, rather than accommodating ways of working to school and community norms and practices, can also be more difficult. The threat of school closure in response to falling enrolments can make it harder to promote constant school improvement and development (Wildy, Siguräardóttir and Faulkner, 2014[141]). In addition, women may be more prone to gender discrimination given gendered expectations within some rural communities and have greater difficulty in taking on a leadership role (Preston, Jakubiec and Kooymans, 2013[139]; Downes and Roberts, 2018[69]).

Figure 20. The rural-urban gap in the need for professional development

Difference in the share of teachers reporting at least some need for professional development in…



Notes: Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, TALIS 2013 Database (http://www.oecd.org/education/school/talis-2013-results.htm).

4.9. School-community relations

Rural schools may be able to benefit from the familiarity, community spirit and durable relationships in villages by involving parents and the wider community in students' learning and in school decision-making (Sheridan et al., 2017[142]; Irvin et al., 2011[56]). The small size of rural communities may support the development of welcoming school cultures and provide opportunities for contact between parents and school staff in other contexts than the school (Parks, 2018[143]). Student bodies which tend to be more culturally homogeneous in rural areas may foster knowledge, trust and collaboration among teachers, students and their families (McPherson, Smith-Lovin and Cook, 2001[144]). Although still hotly debated (Morales, 2013[145]), some studies argue, in fact, that higher ethnic diversity can reduce the civic engagement and social capital in local communities (Alesina and La Ferrara, 2002[146]; Putnam, 2007[147]). As discussed above, demographics are also changing in rural areas, however, and rural schools and their staff need to be responsive to diverse communities and students, such as indigenous or migrant populations.

At the same time, schools in rural and remote areas are critical for the social cohesion and life of rural communities (Kalaoja and Pietarinen, 2009[148]), and an important employer in rural areas (Sipple and Brent, 2015[89]). This is also why some municipalities in the state of Schleswig-Holstein in Germany invest in their local school (e.g. infrastructure, maintenance, transport and after-school activities) to attract young families, maintain and increase enrolments, and avoid school closures (Jahnke and Hoffmann, 2017[149]).

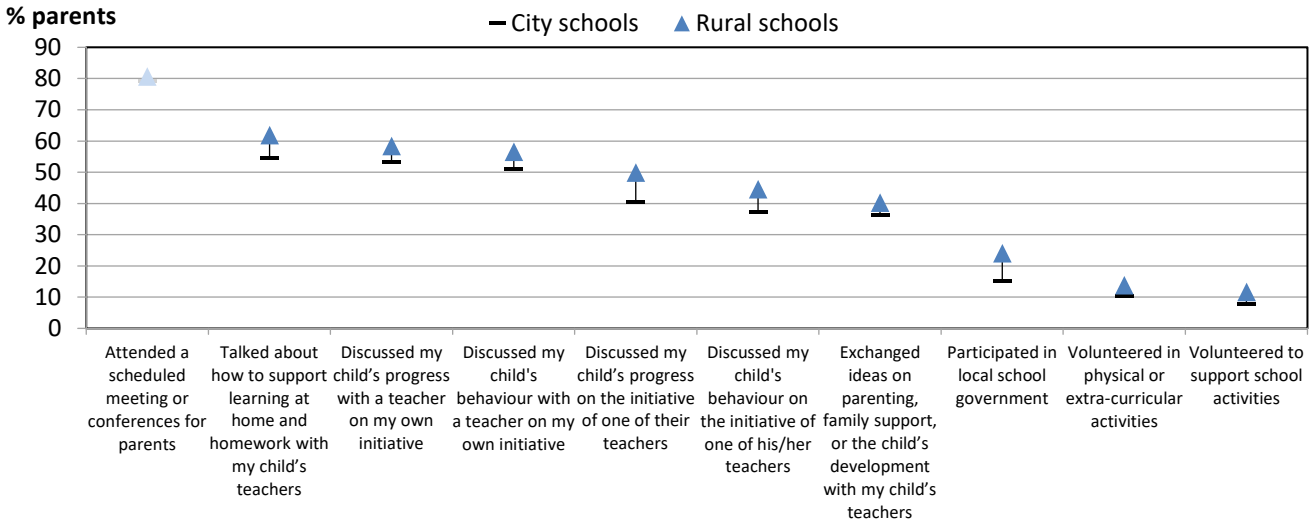
Some studies find that rural parents are more likely to volunteer and participate in school activities than their urban counterparts (Provasnik et al., 2007[71]), but these findings are

not universal (Prater, Bermudez and Owens, 1997[150]). In a review of the literature on family involvement in rural contexts, Semke and Sheridan (2012[58]), for example, found that some issues around family involvement will not be that different between rural and urban schools, while others will differ.

Looking at data from PISA 2015, on average across the nine OECD school systems that distributed the parent questionnaire, parents in rural schools participate more in school activities, such as discussing their child's progress, volunteering to support school activities and participating in school government, than parents in city schools, according to their own reports (Figure 21). For instance, about half of parents in rural schools discussed their child's progress on the initiative of teachers in schools, compared to 40% of parents in urban schools. Similarly, only 15% of parents in city schools reported having participated in the school government during the last academic year, whereas 24% parents in rural schools reported so.

Figure 21. Parental involvement in school activities, by school location

OECD average (nine education systems), parents' self-reports



Notes: The nine OECD education systems include Belgium (Flemish Community), Chile, France, Germany, Ireland, Italy, Korea, Luxembourg, Mexico, Portugal, Scotland (United Kingdom) and Spain.
Statistically significant differences are marked in a darker tone.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database (http://www.oecd.org/education/school/talis-2013-results.htm).

Rural life and community relations may be one of the factors that attract some teachers and school leaders to work in a rural school, but it may also act as a barrier for others. Some educators may find it difficult to establish new relationships, fit into the community and work and live with less privacy and closer to colleagues than is typically the case in urban contexts (Yarrow et al., 1999[115]; Downes and Roberts, 2018[69]). School leaders may struggle balancing school objectives with the diverse interests of parents and community members, and will need an understanding of the strong role the school may have for the community (Preston, Jakubiec and Kooymans, 2013[139]). In-depth qualitative studies from Colombia and Turkey furthermore point out that it can be difficult to bridge gaps between teachers and school leaders, on the one hand, and rural communities and families, on the

other, and to establish participatory and democratic school cultures (Rivera Sepúlveda, 2016[151]; Çiftçi and Cin, 2018[152]).

4.10. Communications and technology

While the benefits of enhanced communications are not exclusive to small and remote areas, they typically bring greater benefits to these areas than to large urban centres, which are already "connected" and easily accessible. The emergence of mobile phones, personal computers, the Internet and other information and communication technologies have connected rural schools to the wider education community as never before. At the same time, the development of better, cheaper and more efficient transportation has progressively reduced the geographical isolation of many rural communities. While urban areas still enjoy better communications than rural areas, the gap has improved considerably in the last few decades across OECD countries (OECD, 2010[17]).

Transportation costs often represent a larger share of public and private education spending in rural than in urban communities (Reeves, 2003[153]; Showalter et al., 2017[9]) so the development of better road systems and motorised vehicles are likely to benefit rural communities more than large urban centres. With regard to the delivery of rural education, closing the distance between rural communities and larger urban centres, for instance, enhances the availability of after-school activities and professional development opportunities for students and teachers who stay in small rural areas.

Distance education has been used to reach remote communities through different and changing formats for a long time – from the use of correspondence courses, educational television, audio and videoconferencing, to online learning (Sipple and Brent, 2015[89]). Computers and the Internet have opened up significant opportunities for improving the delivery of rural education by linking students and teachers who are separated geographically. In Scotland (United Kingdom), for example, technology has been promoted as a tool for peer learning and collaboration among staff (e.g. through online learning platforms and communities of practice) (Scottish Government, 2013[154]).

Governments more generally appear to have confidence in the transformational solutions that computers and the Internet can bring to learning in rural areas, or so it seems based on the large availability of connected computers in rural schools across OECD countries. On average across OECD countries, there is about one computer per student in rural schools, of which 94% are connected to the Internet, compared to 0.7 computers per student in city schools, of which 97% are connected to the Internet (OECD, 2016[24]). In Mexico, however, only about 4 out of 10 computers in rural schools are connected to the Internet, compared to 9 out of 10 in urban schools. In many partner countries too, less than half of computers in rural schools are connected to the Internet, such as in Kosovo (13%), Colombia (38%), the Dominican Republic (40%), Peru (45%), Indonesia (45%) and Albania (47%). Without an Internet connection, the potential of computers is severely limited.

Despite these efforts to digitally equip rural schools, relatively little is known about the cost-effectiveness of distance education in general, and in rural contexts in particular. Though purchase costs are declining, maintenance costs may be high, and devices may need to be replaced frequently (Bulman and Fairlie, 2016[155]). Looking at the potential of technology for student learning, few studies compare distance education to face-to-face instruction, and methodological limitations make it difficult to draw definitive conclusions (Sipple and Brent, 2015[89]). Research suggests that distance education can be equally effective as traditional instruction, but not more so (Cavanaugh et al., 2004[156]; Means

et al., 2010[157]). A particular concern seems, however, seems to be the risk for dropping out of distance education. For online courses, some estimates suggest that dropout may be 10% to 20% higher than in traditional face-to-face settings (de la Varre et al., 2014[158]). Studies also highlight that educational benefits differ depending on students' characteristics, such as motivation, age and preparation (Ares Abalde, 2014[1]; Bettinger and Loeb, 2017[159]).

Evidence on the impact of technology on learning in general raises cautions about the extent to which schools and education systems have leveraged the potential of technology (OECD, 2015[160]; Echazarra, 2018[161]). However, in the case of rural schools, technology may help overcome some of the challenges particular to rural education, such as enabling rural schools to offer courses they might otherwise not be able to offer, or facilitating opportunities for collaboration. The question, then, turns to the design, delivery and support of ICT solutions, e.g. to enable learning in good distance education (Hannum et al., 2009[162]; Sipple and Brent, 2015[89]).

5. Ensuring high quality learning for rural students

The recipe for an excellent and equitable education is probably not that different across rural and urban settings. This may include, for example, using learning time productively, creating a positive learning environment, using multiple assessments strategically, and building a skilled and dedicated community of school professionals (OECD, 2016[24]) However, in some areas the provision of education in rural communities requires targeted responses to compensate for challenges related to distance and size, but also socio-economic factors that play an important role in explaining rural-urban gaps. While not meant to be comprehensive, this section puts forward some ideas for policies that may help overcome the barriers, and make the most of the opportunities specific to rural education.

5.1. Contextualising policies and research by reflecting the role of place, and developing local and school capacity in rural areas

The design of education policies has much to gain from taking into account the different contexts in which schools are embedded and the ways in which they interact with and create differences in educational processes and outcomes – rural places being one such context among others. Likewise, it is clear that education policy can only benefit from broader and more comprehensive approaches to address the challenges linked to particular places – be it building and maintaining thriving rural communities (e.g. through links with regional development, labour market and innovation policies) or reducing segregation in the case of urban areas (e.g. through links with housing and transportation policies).

More contextualised policies should reflect the differences between types of rurality. Remote rural schools are likely to face greater difficulties in providing a good education than rural schools at an urban fringe, for example (Greenough and Nelson, 2015[163]). Education policy that reflects the needs of schools in different geographical contexts therefore requires adequate statistical definitions, so resources can be targeted effectively and the use of resources can be monitored and evaluated. This includes adequate decisions on the unit of analysis which determines the number of concerned students as well as sufficient attention to diversity and change in rural areas (Arnold et al., 2007[164]).

For more contextualised policies to take shape, policymaking and design processes may need to take into account that rural communities may lack the political clout to make their voices heard and to promote their social and economic interests (Lipton, 1977[165]; Theobald, 1997[166]). In a majority of countries the demographic weight of rural communities has been decreasing (Figure 3). Policy reviews or research programmes can serve to learn more about the current situation of rural schools and students, and provide a basis for specific policies to address identified challenges (see Box 1). In the United States, for example, Congress mandated the Department of Education to review the extent to which its programmes, policies and regulations consider and address the needs of rural schools and education authorities, resulting in the publication of a Rural Report and steps to increase the participation of rural stakeholders in the department's decision-making process through an Office of Rural and Community Engagements. This office seeks to promote

greater internal and external awareness of rural education needs (U.S. Department of Education, 2018[167]).

Research and evaluation have an important role to play in increasing the awareness of place as a central variable for learning experiences and outcomes. Importantly, research can increase our understanding of the ways in which location interacts with other factors such as socio-economic background, ethnicity and gender, that is the variety of experiences of different groups within rural areas (Bæck, 2015[20]). The moderating effect of school locations on the evaluation of specific interventions also requires more attention. For research carried out in the United States, a study found that schools in small rural districts tend to be markedly underrepresented if not excluded from many rigorous evaluations, even where they comprise a significant share of the students impacted by potential policy changes (Stuart et al., 2017[168]).

Contextualised policies to create high quality teaching and learning environments for rural students should likely include efforts to build capacity and leadership of education authorities and schools, and ensure adequate resources for rural communities. For this to happen, school funding arrangements need to recognise that not all costs are linear, while maintaining incentives for efficient organisation of the school network for most schools and effective school network management (OECD, 2017[72]; OECD, 2018[2]). Small rural schools could, for example, receive fixed funds for their operation in such a way that they count with a minimum level of resources to provide education, to benefit from pedagogical supervision and support, and to invest in staff and supportive professional working environments. For the school year 2018-19, France has, for example, invested in rural schools through priority actions which include the revitalisation of boarding schools, a strategy to improve the quality of extracurricular activities (*Plan mercredi*), and a programme to build up a supply of books in remote schools that do not have a school library (*Plan bibliothèque*) (Ministère de l'Éducation nationale et de la Jeunesse, 2018[169]). Countries in Latin America have also put in place specific programmes or created particular bodies to strengthen provision in rural areas (Montero and Uccelli, 2016[170]) (see Box 2).

Box 1. Rural education reviews in Australia and Canada

Australia

In 2017, the federal government of Australia commissioned an Independent Review into Regional, Rural and Remote Education. This review entailed the publication of a discussion paper, a literature review, and the consultation of education authorities, communities and schools to examine the challenges faced by students in rural and remote areas, and to find innovative solutions to help them succeed at school and beyond. It also entailed an assessment of access to affordable accommodation for regional, rural and remote students relocating to pursue tertiary education.

The review resulted in a final report providing recommendations on curriculum and assessment, principals and teachers, career education, early childhood and the importance of school readiness, expanding vocational education and training and university opportunities and pathways, philanthropy and entrepreneurship, information and communication technologies, improving the support available to move away from home, and the importance of education in improving the economic sustainability of regional areas.

The Australian government's response to the review, which was released on 30 May 2018, builds on initiatives across Australian government departments and the partnership with

states and territories to enhance policies and programmes in regional, rural and remote communities. For example, work is being undertaken by the Australian Institute for Teaching and School Leadership to review available research into best practice approaches to teacher and school leader training, and professional learning and support in regional, rural and remote settings. Further work is also being done to improve online information on post school career options through an innovative pilot program that offers virtual work experience opportunities in science, technology, mathematics and engineering (STEM) to regional, rural and remote school students.

States and territories in Australia have designed their own policies and strategies to improve the quality of education in rural areas. The Department of Education of **New South Wales**, for example, counts with a dedicated Rural and Distance Education Unit that supports schools in rural and remote areas and those providing distance education. The department has also set in place a strategy and actions to address the needs of students, teachers, leaders and parents in rural and remote areas informed by an extensive consultation process.

This Rural and Remote Blueprint for Action, implemented since 2014, aims to: improve early childhood education in rural and remote communities; provide incentives to attract and retain quality teachers and leaders to rural and remote schools; offer co-ordinated interagency health and well-being in rural and remote areas; and expand curriculum opportunities for students in rural and remote areas through the establishment of a virtual selective high school, Aurora College. The strategy has been informed by research and evaluations undertaken by the Centre for Education Statistics and Evaluation.

Similarly, the state of **Queensland** has put in place an action plan to support rural and remote education. This action plan, which was informed by community consultations, stakeholder meetings and an online survey, focuses on three key areas and goals: Every rural and remote student succeeding; Valuing our people; and Building positive partnerships. The state has also been in the process of establishing four Rural and Remote Centres for Learning and Wellbeing to provide professional learning and capability development for teachers and school leaders at all stages of their careers, to support the wellbeing of staff and to assist in the facilitation of interagency support for students and their families. A Partners in Learning programme assists home tutors of students enrolled in a School of Distance Education to improve their skills in supporting children's reading.

Sources: https://www.education.gov.au/independent-review-regional-rural-and-remote-education
https://education.nsw.gov.au/our-priorities/improve-student-outcomes/rural-and-remote-education-blueprint-at-a-glance
https://education.qld.gov.au/schools-educators/other-education/rural-and-remote-education

Canada

Provinces in Canada have also carried out reviews or developed strategies to strengthen education in rural areas. Ontario, for example, carried out a province-wide consultation of parents, students, communities, schools and municipalities and developed a Plan to Strengthen Rural and Northern Education in 2017. This plan envisages support for students and communities through enhanced funding and revised planning guidelines that take into account the unique needs of rural and Northern communities. In 2016-17, British Columbia carried out a review into the experiences, concerns and vision for rural education, resulting in recommendations to help address some of the identified challenges.

Source: http://www.edu.gov.on.ca/eng/parents/rural_schools.html

5.2. Preparing and developing teachers and leaders for rural contexts, and building supportive professional working environments in rural schools

A considerable challenge that rural schools face is the lack of preparedness among teachers and school leaders for life and work in rural communities and teaching and learning in rural schools. To overcome such problems of adaptation, some rural communities have opted for "grow your own" strategies whereby local residents are identified and hired as potential rural teachers and local students are "guided" into a teaching career (Schulken, 2010[112]; Schafft, 2016[86]). Such models may also be an effective way for staffing rural schools where shortages exist given research from the United States which shows that teacher labour markets have a strong local dimension, with teachers often having a strong preference for staying close to home in their job search (Boyd et al., 2004[171]; Reininger, 2012[172]; Engel, Jacob and Curran, 2014[173]). As has been found in Iceland, teacher education programmes in regional centres can help increase the supply of qualified teachers in these regional centres, while distance education options may help supply qualified teachers in more rural and remote areas (Bjarnason and Thorarinsdottir, 2017[174]).

Including placements in rural and remote schools combined with support for students to take up such placements or facilitating study visits to rural and remote areas in initial teacher education programmes may be a further option to prepare future teachers for rural areas. For instance, the University of South Dakota in the United States included a rural teaching track in their initial teacher preparation programme (Schulken, 2010[112]). Studies conducted in Australia show how place-conscious teacher preparation programmes can help students become familiar with rural communities, develop realistic expectations of rural living, and encourage them to look for teacher appointments in rural schools (Lock, 2008[175]; Sharplin, 2002[176]; White and Reid, 2008[177]).

Considering teachers' level of preparedness for rural education in the recruitment process may be a possibility to ensure a good match between teachers and their place of work, therefore aiding in retention. For instance, hiring authorities may include criteria such as candidates' experience in multigrade, multi-subject and individualised teaching and the use of information and communication technologies for educational purposes. Where certain teaching positions are particularly difficult to fill, financial incentives could be an option, but would need to be evaluated in terms of cost-effectiveness and have to consider differences in cost of living, among others. While financial incentives have been shown to be effective in attracting teachers to rural schools, they have been less so for remote schools (Dal Bó, Finan and Rossi, 2013[178]).

Supportive working environments, that feature quality relationships and collaboration among staff, support by school leaders, and shared expectations for students, have been shown to be key for keeping teachers in schools, helping teachers develop and be effective in classrooms (Papay and Kraft, 2017[179]; Johnson, Kraft and Papay, 2012[103]). A supportive school environment has also been found to influence teacher retention in rural schools (Lazarev et al., 2017[180]).

Creating such professional environments in rural contexts should therefore be a priority. However, rural contexts face particular challenges given the small size and nature of educator positions. Teachers are often isolated, especially when teaching in small one-teacher schools, and have fewer opportunities to exchange ideas, and less contact with external staff, such as teacher educators or supervisors. At the same time, teachers often cover multiple subjects and after-school programmes and assume multiple roles, such as leadership and management as well as classroom teaching, creating particular pressures on

time. The creation of professional opportunities and supportive working conditions in rural schools therefore requires particular investments and models (e.g. to build well-designed teacher teams which provide opportunities to learn from one another's practice across schools or the leadership required for establishing supports and building school cultures).

Box 2. Rural education programmes in Latin America

Chile

In Chile, a Basic Rural Education Programme (*Programa de Mejoramiento de la Calidad y Equidad de la Educación para las Escuelas Básicas Rurales*) was created in 1992, providing technical assistance to rural schools. Originally, the programme provided pedagogical materials, teacher training and professional development, and curriculum adaptation to rural contexts. The programme also created "rural micro-centres", local networks of rural schools and teachers that meet regularly to collaborate in academic planning and evaluation, which continue to operate. The ministry keeps supporting multigrade rural schools in the development of methodologies that promote quality learning and students' continuity in their studies. Since 2015, the ministry has organised an annual National Seminar on Rural Education to facilitate the exchange between the co-ordinators of rural micro-centres across the country, regional co-ordinators of rural education and technical heads of provincial departments of education.

Sources: https://rural.mineduc.cl
Santiago et al., (2017[181]), OECD Reviews of School Resources: Chile, OECD Publishing, Paris, https://doi.org/10.1787/9789264285637-en

Colombia

In Colombia, a Rural Education Programme (*Programa de Educación Rural*, PER) implemented between 2002 and 2015 had the objective to raise access to a quality education in rural areas, to prevent dropout from school and to make education relevant for the needs of rural students. The programme followed a multidimensional approach that included the use of flexible pedagogical models and teaching materials designed for rural schools, teacher education and development, and capacity building of participating Secretaries of Education. Additional strategies focused on the improvement of basic competencies in language and mathematics in basic primary education and the teaching of English. An impact evaluation found positive and significant effects on efficiency (dropout, pass and failure rates) and quality (achievement in standardised language assessment) in the schools where it was implemented (Rodríguez, Sánchez and Armenta, 2010[182]; Ramos, Duque and Nieto, 2016[183]). Education in rural areas has been given new impetus with the peace agreement between the Colombian government and the Revolutionary Armed Forces of Colombia in 2016. The peace agreement entails a commitment to a comprehensive rural reform, part of which forms a Special Rural Education Plan (*Plan Especial de Educación Rural*, PEER).

Sources: http://aprende.colombiaaprende.edu.co/es/per
Radinger et al., (2018[184]), OECD Reviews of School Resources: Colombia 2018, OECD Publishing, Paris, https://doi.org/10.1787/9789264303751-en
Sánchez, (2018[185]), OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools: Country Background Report for Colombia, Ministerio de Educación Nacional, Bogotá

Mexico

In Mexico, the National Council for Educational Development (*Consejo Nacional de Fomento Educativo*, CONAFE) was created in the 1970s as a decentralised body to expand educational coverage and reduce educational disadvantages in rural and remote areas. Its work has resulted in creation of educational models that serve diverse populations that could not be adequately attended through the regular education system from initial to secondary levels. This also includes specific pedagogical and curricular approaches for indigenous students, migrant children and children with special educational needs.

Through its Community Education model, CONAFE provides education to very small and remote communities in multigrade settings. The model has recently (2015) been revised to focus on collaboration and dialogue based learning, promoting the creation of tutoring networks and the joint work of students with different knowledge and ages within learning communities.

Leaders for Community Education act as learning facilitators, while the community actively participates in the organisation and provision of education, enriching pedagogical strategies and extracurricular activities with local knowledge. CONAFE, in turn, provides operational support and the necessary materials. Furthermore, facilitators, typically young people between the ages of 16 and 29 without professional teacher education and who come from rural backgrounds themselves, receive six weeks of training and take courses in specific subject areas and are supported by itinerant pedagogical advisors. Attracting and developing the competencies of facilitators has nevertheless been identified as a frequent challenge for CONAFE.

Sources: https://www.gob.mx/conafe
CONAFE (2016), *Marco Curricular de la Educación Comunitaria Modelo ABCD Aprendizaje Basado en la Colaboración y el Diálogo* [Curriculum for Community Education Model ABCD Learning Based on Collaboration and Dialogue], Consejo Nacional de Fomento Educativo, Ciudad de México, https://www.gob.mx/cms/uploads/attachment/file/411245/Marco_Curricular.pdf
INEE (2018), *Panorama Educativo de México 2017. Indicadores del Sistema Educativo Nacional. Educación básica y media superior* [Educational Panorama of Mexico 2017. Indicators of the National Educational System. Basic and upper secondary education], INEE, Ciudad de México, http://publicaciones.inee.edu.mx/buscadorPub/P1/B/116/P1B116.pdf

5.3. Connecting rural schools with other schools and supports

Some of the challenges rural schools face can be minimised by strategically connecting rural schools with other schools and the local community (see Box 3). Collaboration between rural schools – sharing resources, experience and/or management as in school clusters – can create the necessary critical mass of knowledge, resources and students to expand the education programmes, specialised support, extracurricular activities and professional development offered to students and teachers. Rural schools, for instance, can share the costs and time of specialty teachers and create virtual communities of practice to improve their teaching skills (Barajas et al., 2007[186]). When travel distance and time is reasonable, a group of rural schools could also offer joint education programmes and extracurricular activities so that a critical mass of students is reached in at least one of the schools. School collaboration can also foster networking opportunities and professional interaction among school leaders (Clarke and Wildy, 2011[187]).

Box 3. School collaboration in France and Spain

France

In **France**, there are several collaborative arrangements for rural schools, such as grouping students according to their grade in several neighbouring schools (*Regroupements pédagogiques intercommunaux dispersés*) – for example, pre-school in one village, first years of primary education in another village, final years of primary education in a third village – teachers visiting rural schools regularly promoting the use of educational materials and ICT equipment in the classroom (*Équipe mobile académique de liaison et d'animation*), or teachers and students from neighbouring rural schools organising common activities (*École rurale et communication*) (Alpe, 2012[55]).

Spain

With the aim of increasing efficiency and providing greater learning opportunities to students, neighbouring rural schools in **Spain** often operate as a single administrative school, share management, teachers and educational materials, and organise regular staff meetings and student get-togethers so that the "school hallways are the roads between rural villages" (Lacort Navarro, 2014[188]). This type of arrangement, which receives different names across Spain (*Colegio Rural Agrupado, Zonas Escolares Rurales, Colegio Público Rural* or *Colectivos de Escuelas Rurales)*, represents approximately 6% of all public schools across the country.

Rural schools can also partner with urban schools, particularly those that share similar features. What many rural schools are doing out of necessity, such as multigrade and multi-age teaching, some urban schools are doing out of choice. Montessori schools, for instance, have been advocating for a multi-age grouping of students for over a century (Proehl et al., 2013[189]). Rural schools could also gain insights from such well-developed pedagogies and practices in urban contexts.

The success of networks for rural schools to overcome capacity and resource constraints linked to location and size depends on a number of factors. Distance and the time it takes to travel between school sites as well as a lack of a common understanding among different school communities for the need to collaborate can act as barriers. Trust and collaborative working relations between schools, clear goals, mutual benefits and actionable results emerging from working together, on the other hand, can facilitate successful collaboration among rural schools (Muijs, 2015[190]).

Given the central role that schools play in many rural communities, collaboration with the wider community is essential (Schafft, 2016[86]; Theobald and Nachtigal, 1995[191]). Local schools can collaborate with sports club, arts centres, local museums, health centres, the police and other local organisations. Rural schools themselves, particularly those in small and remote areas, could turn into local community centres offering a wide range of services, such as a library, a nursery, elderly care and other social services. As the example of a Scottish village demonstrates, rural schools can even share the premises with the police or the fire station (Scottish Government, 2013[154]). While the rationale for these partnerships is usually a financial one, they can also be justified from an educational perspective. Some studies suggest that a greater emphasis on community-based and authentic learning can benefit student learning (Bouillion and Gomez, 2001[192]). Partnerships between the school,

Unclassified

health and community services can be particularly useful to overcome the numerous barriers faced by some rural children (Clarke and Wildy, 2011[187]).

Finally, local schools could collaborate with local businesses in numerous ways. Students, particularly those in pre-vocational and vocational programmes, could benefit from job shadowing, internships, school-to-work and entrepreneurship programmes (Schafft and Harmon, 2011[193]). Not only can these programmes ease the transition to the labour market for students, they may also help curb the rural brain drain (Khattri, Riley and Kane, 1997[194]). Some studies have documented how the close relationships established between the school staff and local businessmen can help the school raise funds, improve the school facilities and organise activities (Bauch, 2001[30]).

5.4. Making effective use of technologies and distance learning for student and educator learning

Information and Communication Technologies, such as computers, tablets, smartphones and interactive whiteboards, can amplify good teaching, enhance student motivation and, in some instances, academic performance if they are effectively integrated into daily teaching and learning (OECD, 2015[160]; Toyama, 2011[195]; Trimmel and Bachmann, 2004[196]). Integrating computer and other digital devices in schools can also ensure that all students, including those without access to computers and the Internet at home, can learn the necessary ICT skills to fully participate in 21st century knowledge societies. For the case of learning in rural contexts specifically, information and communication technologies can help overcome the geographical isolation – and mitigate the greater costs associated with the provision of education – by connecting students, teachers and schools to extended learning resources and the wider learning community (Warschauer, 2008[197]).

Policies to promote the use of ICT can aim to expand the digital connectivity of schools (i.e. hardware), develop digital learning resources (i.e. software), or seek to improve the effective use of technologies through training and development. The largest educational investments on new technologies globally have typically been dedicated to increasing the number of computers and other digital devices in schools. In Spain, for example, the *Plan Escuela 2.0*, a government programme implemented between 2009 and 2012, intended to provide one laptop per student and create digital classrooms in all schools (Vilaplana Prieto, 2014[198]). Rural schools are often the main beneficiaries of such programmes.

Countries may also put in place specific programmes to expand ICT equipment in rural schools. In Chile, the programme Rural Connections (*Enlaces Rural*) has provided computers and digital infrastructure to rural and remote schools since 2000 through a model specifically designed for integrating new technologies in rural contexts. The strategy encompasses support to help teachers develop technical competencies and make effective use of ICT in multigrade classrooms. In 2014, a complementary program Integrating Rurality (*Integrando la Ruralidad*) offered offline digital resources for 2 043 schools with limited Internet access (Santiago et al., 2017[181]). In 2018, France launched an Innovative Digital Schools and Rurality Programme (*Programme Écoles numériques innovantes et ruralité*). Endowed with 20 million euros, the programme plans to equip 3 000 schools with digital equipment to promote learning, enrich relationships with families and reinforce the attractiveness of the school and rural territories (Ministère de l'Éducation nationale et de la Jeunesse, 2018[169]).

Evidence on the educational benefits of such programmes is, however, still mixed. A large-scale randomised evaluation of the one-laptop-per-child programme in Peru, for

instance, showed a large boost in the number of computers per student, but modest effects on learning outcomes (Cristia et al., 2012[199]). This highlights the role of adequate training for teachers so they feel comfortable using new technologies and so they are able to do so effectively. This also requires a definition of what it means to be digitally competent for teachers, and how to develop, evaluate and certify these skills – the first and often most challenging step. In Australia, the Australian Professional Standards for Teachers provide guidance for teachers to know what they should be aiming to achieve at every stage of their career. Under focus area 2.6 of the standards, graduate teachers are expected to be able to implement teaching strategies for using ICT to expand curriculum learning opportunities for students. The success of such standards depends on the involvement and coordination of stakeholders – in particular practitioners – along the process, and how standards are integrated into the training and evaluations of teachers.

Distance learning creates opportunities for rural schools, teachers and students that would otherwise not be available to them (see Box 4 for e-learning and virtual learning environments in Canada and Italy). In the United States, for example, most rural school districts have turned to one or more forms of distance education with the primary purpose of offering courses otherwise not available at school, such as advanced placement, dual enrolment, credit recovery, career and technical education courses. Distance education is being provided by independent vendors, post-secondary institutions, other school districts and state sponsored virtual schools (Sipple and Brent, 2015[89]). Rural schools could also partner and share teaching through virtual learning environments with each other, which may help expand the course offer, but retain greater ownership over curriculum and instruction.

More, however, still needs to be known about effective implementation of distance learning and issues such as funding and scheduling or the needs of different types of learners (Hannum et al., 2009[162]), as well as the preparation and support for different types of staff (e.g. on-site facilitators in blended forms of online learning) (Hendrix and Degner, 2016[200]). In small rural communities in Sweden, for example, synchronous distance education may be provided by a remote teacher through ICT in areas of study that would otherwise not be available. Students are however at the same time supported by a supervisor on site (Utbildningsdepartementet, 2011[201]).

Box 4. E-learning resources for schools, teachers and students

Canada

In the province of Ontario, e-learning resources include a virtual learning environment and a digital library of materials relevant to the Ontario curriculum. Students can use these to take courses fully online and/or to benefit from blended learning, which allows them to access resources during and outside school hours to supplement face-to-face lessons. In both approaches, the password-protected virtual learning environment provides a suite of tools allowing students to communicate and interact with their teacher and classmates. The Ontario 2016 budget committed to support equitable and affordable access to high-speed broadband services in Ontario's schools. As well as e-learning, better broadband access was planned to support the delivery of mental health and well-being services. An example is Ontario's Tele-Mental Health Service, which provides children and youth in rural, remote and underserved communities with access to specialised mental health consultations through videoconferencing.

The Upper Canada District School Board in Eastern Ontario, one of the largest English-language public school boards by geographical area in the province, has been making e-learning more widely available to ensure all students can access the courses they need to complete their secondary school diploma. The school board has been working to build capacity among e-learning teachers to ensure they understand and apply the most effective teaching techniques. This effort aligns with the school board's strategic plan and with the realities of declining enrolment that has led to closure and consolidation discussions.

Source: Ministry of Education (2017), Supporting Students and Communities. A Discussion Paper to Strengthen Education in Ontario's Rural and Remote Communities, Queen's Printer for Ontario, Toronto, https://www.ontario.ca/page/supporting-students-and-communities

Italy

In **Italy**, Small Schools (*Piccole Scuole*) is a project that seeks to promote distance learning in geographically isolated schools through the creation of a national network and the use of ICT. The project has developed two models to facilitate co-operation in secondary education and to improve communication and writing skills through asynchronous and synchronous communication tools, namely shared teaching and expanded learning environments.

Through shared teaching, two or more classes belonging to different schools are connected to each other, through the daily use of videoconferencing, to foster exchange of experience and ensure the teaching of all subjects for children in multi-age classrooms. ICT is the basis to restructure teaching methods and assessment systems, to connect students of different schools and facilitate remote meetings with disciplinary experts and tutors, among others.

In an expanded learning environment, one or more classes work on a common project and organise periodic meetings between teachers, students and/or experts who can use videoconferencing as well as other technological settings according to the type of project. In this case, distance learning is not intended to replace standard teaching practice, but rather complement traditional teaching, facilitate interaction between teachers, students and families, and optimise the use of resources and professional services.

Sources: http://www.indire.it/en/progetto/small-schools
http://piccolescuole.indire.it

5.5. Reorganising school networks

Changing demographics require the effective organisation of local school networks. School consolidation, that is the closure and merger of small schools to form a larger school, has often been advanced as a strategy to save costs and create educational benefits for staff and students. A consolidated school can offer students a greater array of academic programmes, expanded after-school activities and better facilities for learning (Rogers, Glesner and Meyers, 2014[77]). Teachers, on the other hand, may have greater access to educational resources and in-house professional development activities, while assessment data could be used more effectively. Special needs students might also receive more suitable support (Delp, 2015[98]).

However, there are serious risks and costs associated with school consolidation, such as increased transport costs for students' families and relocated staff, reduced parental involvement and social life, deteriorated local services, reduced school choice and other social costs (Bushrod, 1999[202]; Schafft, 2016[86]; Semke and Sheridan, 2012[58]; Valencia, 1985[203]). Evidence on the negative impact of school closures suggests that, following a school closure, students tend to adapt better than staff members, socio-economically disadvantaged students are more negatively affected, and the long-term negative impact is minimised if an alternative publicly-funded schools is available within a reasonable distance (Gronberg et al., 2005[204]; Schafft, 2016[86]; Witten et al., 2001[205]).

The reorganisation of school networks should therefore draw on a broad spectrum of strategies, which includes re-thinking how educational services are defined and distributed across school sites, arrangements for co-operation and resource sharing, and the creation of school clusters, before engaging in consolidation (OECD, 2018[2]). Colombia and Portugal represent two cases that illustrate the potential, but also challenges, of school network reforms and the creation of school clusters to maintain broad coverage (see Liebowitz et al. (2018[206]) and Radinger et al. (2018[184]) for details). When the closure and consolidation of schools is considered the best available option, stakeholders need to be involved along the process – especially school staff and families – to avoid some of the associated costs. The transparent and exhaustive analysis of the impact of school closure for students, families and the local community can be helpful and should evaluate, among other quality aspects, the transport arrangements and costs, parental involvement, social relationships, public resistance, or students' academic outcomes and well-being.

Once the closure of a school is agreed upon, designing an effective and free transportation system for transferred students is essential. In the United States, a massive school busing system began in the 1920s hoping to reduce local resistance to school closures. In the school year 2007/08, as many as 26 million students were carried to school every day, with a cost of around USD 866 per student (Strange et al., 2012[207]). Unfortunately, these transportation systems often detract resources from instruction. The significant consolidation efforts in West Virginia (United States), for instance, have resulted in the highest transportation costs, relative to instructional expenditure, for rural districts across the country (Showalter et al., 2017[9]).

5.6. Facilitating transitions to secondary and post-secondary education and the labour market

The transitions to secondary and post-secondary education can be a serious challenge for rural youth (Figure 8) who often have lower expectations. Rural students also often face considerable financial, logistical and emotional barriers as they move to higher levels of

education. Compared to their urban counterparts, rural students often need to commute or migrate to larger urban centres to continue studying, and are less likely to have access to guidance counsellors and engage in post-secondary preparation activities, such as college campus visits, career exploration activities and job shadowing (Griffin, Hutchins and Meece, 2011[208]).

This requires sufficient attention to supports, such as scholarships, allowances, social and emotional support, career guidance and counselling, and boarding and housing (Nissinen et al., 2018[209]). In the state of Queensland in Australia, for example, Transition Support Services help students and their families in the transition from remote primary school on Cape York, the Northern Peninsula and the Torres Strait to boarding secondary school placements. Transition Support Teachers and Officers work with students at their boarding schools, as well as with staff and families. If young people become disconnected and return to their home communities, the programme works in collaboration with many remote service providers to assist young people and their families to develop and enact a re-engagement action plan (OECD, 2017[210]).

What rural students are taught at school often devalues the rural way of life and can be at odds with labour market demands. This often results in rural students, especially the highly-skilled ones, migrating to urban areas (Schafft, 2016[86]). Several studies in the United States, for example, show that out-migrants from rural areas are generally younger and better skilled than those who decide to stay (Brown and Schafft, 2011[211]; Mills and Hazarika, 2001[212]). More attention may therefore need to be paid to connecting rural education to rural contexts and labour markets (e.g. through high quality models of vocational education and training and opportunities for entrepreneurship). Farm-to-school programmes, for instance, link schools with local food producers, cultivate school gardens, organise school trips to farms, and allocate classroom time to nutrition, health and food systems (Schafft, 2016[86]).

A possible solution is to grant rural schools greater autonomy, particularly over curriculum and assessment, so that they can better adapt teaching to their local circumstances. Rural schools could use greater autonomy to adapt the curriculum to their local circumstances so their values and goals match the interests and identities of their students. However, PISA 2015 data show that, on average across OECD countries, there are little differences between rural and urban schools in the extent to which they (i.e. principals, teachers and school governing boards) have responsibility for school governance (OECD, 2016[24]).

Notes

[1] A study for New South Wales (Australia), for example, suggests that half of all students in rural public primary schools and nearly 90% of those in very remote schools were taught in multigrade classes in 2012 (Centre for Education Statistics and Evaluation (CESE), 2013[213]). A study for Ireland suggests that just under a quarter (24%) of all primary students were taught in multigrade classes combining two grades and 8% were taught in classes made up of three or more grades in 2010/11 (Quail and Smyth, 2014[121]). Similarly, 24% of all primary classes in Switzerland, 16.4% in Finland, and 15.3% in Austria were taught in multigrade settings at the beginning of the 2010s (Smit, Hyry-Beihammer and Raggl, 2015[64]).

[2] For the National Center for Education Statistics (NCES) in the United States, for instance, "rural" includes open and small settlements of less than 2 500 persons that are not in the vicinity of the densely populated suburban areas (Barley and Beesley, 2007[216]). The United Nation's Food and Agriculture Organisation (FAO) defines rural areas as settlements with an average of 10 000 inhabitants and located in areas where the dominant features are farms, forests, bodies of water, mountains and/or desserts; the OECD considers local areas as "rural" if the population density is below 150 inhabitants per km²; the European Union (EU) combines information on population density, population size and contiguity to classify geographical areas, and the United Nations relies mostly on national definitions of rural areas (OECD, 2011[214]; Dijkstra and Poelman, 2014[217]; Sauvageot et al., 2007[215]).

[3] OECD member countries participating in PISA 2015 include the following: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States. Some of these countries are not included in the working paper because the number of sampled students and schools in rural areas did not reach the reporting threshold of 30 students and 5 schools. Lithuania joined the OECD in 2018 and is therefore not included in the OECD PISA 2015 average.

[4] OECD member countries and economies participating in TALIS 2013 include the following: Alberta (Canada), Australia, Chile, Czech Republic, Denmark, England (United Kingdom), Estonia, Finland, Flanders (Belgium), France, Iceland, Israel, Italy, Japan, Korea, Mexico, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain and Sweden. The United States also participated in TALIS 2013 but did not meet the international standards for participation rates. Latvia joined the OECD in 2016 and Lithuania in 2018 and are therefore not included in the OECD TALIS 2013 average.

Annex A.

Table A.1. Unweighted number of students and schools in PISA 2015, by school location

No cases
Below the threshold
Just above the reporting threshold
Close to the reporting threshold

OECD countries	Rural area or village (fewer than 3 000 people)		City (over 100 000 people)	
	Students	Schools	Students	Schools
Australia	611	43	8 399	435
Austria	549	25	2 323	84
Belgium	257	7	2 415	75
Canada	2 056	110	8 195	287
Chile	99	9	4 783	145
Czech Republic	422	46	1 704	72
Denmark	637	31	1 608	79
Estonia	878	61	1 749	52
Finland	726	24	1 628	46

Partner countries	Rural area or village (fewer than 3 000 people)		City (over 100 000 people)	
	Students	Schools	Students	Schools
Albania	1 239	89	1 670	56
Algeria	763	23	865	24
Brazil	687	41	8 418	281
Bulgaria	151	14	2 349	65
B-S-J-G (China)	1 008	31	3 703	97
CABA (Argentina)	0	0	1 517	52
Colombia	935	47	7 244	216
Costa Rica	1 303	41	865	26

OECD countries	Rural area or village (fewer than 3 000 people)		City (over 100 000 people)	
	Students	Schools	Students	Schools
France	237	17	1 708	64
Germany	350	13	1 385	55
Greece	370	21	1 818	64
Hungary	61	22	2 482	94
Iceland	607	50	1 010	23
Ireland	1 045	31	1 594	46
Israel	908	25	2 429	65
Italy	247	11	2 144	88
Japan	13	1	4 749	141
Korea	86	3	4 779	141
Latvia	763	70	1 488	68
Luxembourg	0	0	2 287	20
Mexico	783	60	3 874	121
Netherlands	41	2	1 013	35
New Zealand	135	9	1 990	73
Norway	943	45	969	39
Poland	1 609	60	1 116	45
Portugal	448	22	1 029	33
Slovak Republic	893	74	740	32

Partner countries	Rural area or village (fewer than 3 000 people)		City (over 100 000 people)	
	Students	Schools	Students	Schools
Croatia	76	2	2 318	62
Dominican Republic	614	32	1 126	39
FYROM	168	5	1 889	35
Georgia	1 299	103	2 192	80
Hong Kong (China)	0	0	5 359	138
Indonesia	1 664	69	1 167	40
Jordan	786	38	2 815	91
Kosovo	495	65	1 351	50
Lebanon	611	45	1 061	53
Lithuania	1 371	107	2 670	101
Macao (China)	8	1	4 456	43
Malta	495	8	0	0
Moldova	2 585	132	1 035	36
Montenegro	27	1	1 537	13
Peru	1 691	89	942	35
Qatar	527	13	6 055	77
Romania	433	35	1 502	51
Russia	608	50	3 235	91
Singapore	0	0	5 267	153

OECD countries	Rural area or village (fewer than 3 000 people)		City (over 100 000 people)	
	Students	Schools	Students	Schools
Slovenia	257	23	1 146	51
Spain	229	10	2 312	67
Sweden	m	m	m	m
Switzerland	339	19	1 052	40
Turkey	38	8	3 671	110
United Kingdom	841	35	2 633	100
United States	582	19	2 133	68

Partner countries	Rural area or village (fewer than 3 000 people)		City (over 100 000 people)	
	Students	Schools	Schools	Students
Chinese Taipei	61	3	4 483	122
Thailand	1 302	71	2 161	61
Trinidad and Tobago	765	27	0	0
Tunisia	223	7	1 325	41
United Arab Emirates	822	35	8 369	267
Uruguay	317	15	2 370	84
Viet Nam	2 526	86	1 447	43

Notes: The reporting threshold in PISA is 30 students and 5 schools. Countries not reaching the threshold for both rural areas and cities are not included in the analyses.
All figures and data are available online at www.oecd.org/pisa/sitedocument/Working-Paper-Rural-Education.xlsx.
Source: OECD, PISA 2015 Database, Table II.A1.3 (http://www.oecd.org/pisa/data/2015database/).

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