

Polish Regional and Long-Distance Railway Transport During the COVID-19 Pandemic

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Summary

The purpose of this article is to present the changes that took place on the market of passenger transport by rail in the first year of the COVID-19 pandemic caused by SARS-CoV-2. Particular attention has been paid to the railway passenger transport in Poland. Two segments of this transport sector are presented: regional (represented by the POLREGIO company) and long-distance (represented by the PKP Intercity company). An analysis of the available data shows that irrespective of the segment, the year 2020 was characterized by significant reductions in terms of transport, which reached the lowest volumes in April and May, and the financial results of PKP Intercity were worse than in previous years; however, the share of POLREGIO in the market of passenger transport by rail increased. For the purpose of the article, literature and other available sources have been researched and analytical and synthetic methods have been applied. In addition to text, drawings are included.

Keywords: railways, regional railway transport, long-distance railway transport, COVID-19

1. Introduction

The restrictions related to preventing the spread of SARS-CoV-2, including those affecting mobility, significantly changed life and work, both in the individual and social dimension. They caused changes to the business operations of a number of enterprises, and in the transport sector, resulted in major losses.

The first case of the coronavirus in Poland was reported on 4 March 2020 and on 12 March 2020, a state of an epidemiological threat was announced: kindergartens, crèches, schools, and universities were closed. On 13 March 2020, the first restrictions in terms of operating a business were introduced; on 23 March, a state of an epidemic was announced. Between the discovery of the first case in March 2020 and the end of 2020, the number of infections in Poland exceeded 1,295,000 and the number of the samples collected was more than 7,204,000. According to the data compiled by the Polish Ministry of Health, more than 28,500 people died; most of them suffered from accompanying diseases [1].

The first information concerning a novel coronavirus disease discovered in China appeared in December 2019. Its high infectiousness and the quick development of the disease it causes, as seen in Asia, made the World Health Organization (WHO) announce a threat of a pandemic on 30 January 2020 [3] and then, on 12 March 2020, an outbreak of the COVID-19 pandemic [4].

In response, the governments of the particular countries made administrative decisions that stopped international traffic and significantly limited domestic traffic. In just a few days, government actions paralyzed the entire Europe. The first country that introduced partial restrictions in terms of population mobility and in terms of operating a business was Italy, which in February 2020 was fighting COVID-19 in the north of the country [5]. Soon after Italy, other countries also made similar decisions, restricting mobility country-wide in order to stop the spread of the pathogen².

SARS-CoV-2 is a pathogen of animal origin and causes the disease officially known as COVID-19 [7]. It is one of a number of the coronaviruses identified in the recent years since the outbreak of the Severe Acute

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² Timeline of announcements of COVID-19 restrictions: 09/03/2020 – Italy, Finland, 11/03/2020 – Estonia, 12/03/2020 – Denmark, 13/03/2020 – Bulgaria, 14/03/2020 – Poland, Spain, 15/03/2020 – the Netherlands, 16/03/2020 – Austria, the Czech Republic, Lithuania, 17/03/2020 – France, 18/03/2020 – Belgium, Croatia, 19/03/2020 – Portugal, 22/03/2020 – Germany, 23/03/2020 – Greece, 24/03/2020 – Cyprus, 25/03/2020 – Romania, 28/03/2020 – Hungary.

Respiratory Syndrome (SARS) nearly 20 years ago. This is the seventh virus known to infect and attack humans: SARS-CoV, MERS-CoV, and SARS-CoV-2 may cause a severe case of the illness, while KU1, NL63, OC43, and 229E result in a mild version of the disease [7, 8]. The SARS-CoV-2 pathogen is a cause of death and suffering comparable to the consequences of the pandemics from previous centuries, wars, and the Great Crisis of 1929–1933 [11, 12].

The impact of COVID-19 on the economy was researched by a number of entities and institutions [13]. Since the beginning of 2020, organizations representing the particular branches of the transport sector have been taking actions in order to compile and disseminate the information and the research results they were in possession of [14, 15]. Working teams and platforms for the exchange of information were formed and established in order to restrict the spread of the virus. In terms of the issues related to railway transport, both EU organizations (ERA) and non-governmental organizations (UIC) made efforts in order to support the functioning of enterprises in the difficult period of adjusting their operations to the conditions brought about by the outbreak of the pandemic [16–18].

2. Railway transport in the European Union

The development of COVID-19 at the beginning of 2020 surprised all countries and shook global economy. Fear of infection and the restrictions related to mobility caused disruptions in mass transport. At the beginning of 2020, international transport was halted in almost every country and domestic transport was significantly limited, up to 80% [19]. The crisis had a larger impact on passenger transport, but in the first period of restrictions, cargo transport was also substantially limited. In H1 2020, the loss of revenues in railway passenger transport was 40% versus 2019, while at the end of 2020, this figure stood at 41%. The worst results, with losses in excess of 50%, were recorded in November and December 2020 [16]. According to the information published by the CER, the financial loss in the railway sector of the European Union Member States amounted to EUR 26 billion, including EUR 24 billion in passenger transport and EUR 2 billion in cargo transport [27]. The percentage decrease in revenues in the passenger transport sector in the consecutive months of H2 2020 is presented in Figure 1.

In 2020, the situation was much better in cargo transport than in passenger transport; however, between January and June, the result was 15% lower than the one achieved in the corresponding period in 2019 and the loss of revenues as at the end of the year

amounted to 11%. The worst months in H2 were July and August when revenues fell by 13% and 12%, respectively. The percentage decrease in revenues in the cargo transport sector in the consecutive months of H2 2020 is presented in Figure 2.

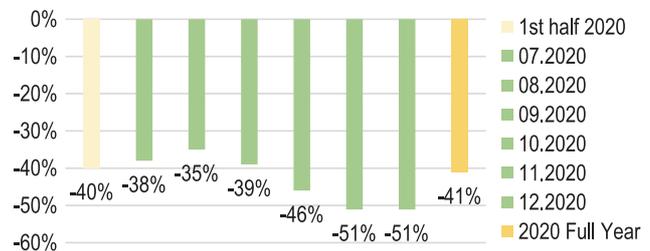


Fig. 1. Loss of revenues in the corresponding months of 2020 and 2019 in passenger transport by rail; own elaboration based on [20]

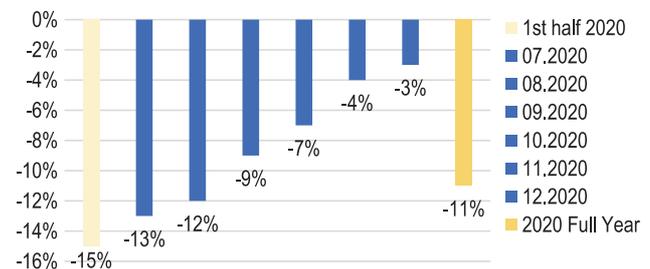


Fig. 2. Loss of revenues in the corresponding months of 2020 and 2019 in cargo transport by rail; own elaboration based on [20]

Due to a lower demand for transport services, the revenues of infrastructure managers also decreased and in H1 2020 were 14% lower than in the corresponding period of the previous year. The summer months were stable at -8%, while in November and December, the losses increased slightly, to -9% and -10%, respectively. The European infrastructure managers closed 2020 with a loss of -11% [20]. The percentage decrease in the revenues of infrastructure managers in the consecutive months of H2 2020 is presented in Figure 3.

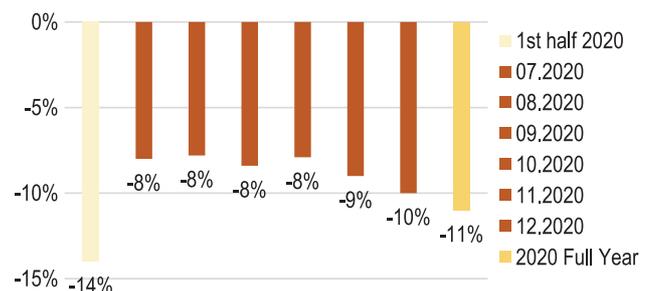


Fig. 3. Loss of revenues of railway infrastructure managers in the corresponding months of 2020 and 2019; own elaboration based on [20]

3. The transport market in Poland

The most characteristic features of the Polish transport market in 2020 were uncertainty, unpredictability, and a major decrease in the transport volume, which affected all transport sectors. In the sector of passenger transport by air, the worst months were April and May when the volumes amounted to just 1.1% (April 2020) and 0.5% (May 2020) of the results achieved in the corresponding months of 2019. In road transport³, the lowest results were also recorded in April and May (21.7% and 20.3%, respectively, as compared with the same months of the previous year). In railway transport, April was the month when the decrease was the highest (23%) in comparison with the corresponding

month of 2019 [28]. A comparison of these two sectors, by months, is presented in Figure 4.

In May 2020, road and air transport in Poland almost disappeared, with only 4,968,000 and 7,000 passengers transported, respectively. In the railway sector, April 2020 was the worst month, with only 6,097 passengers transported [28]. The situation in the sector of passenger transport in 2020 is presented in Figure 5.

In 2020, changes took place in the modal share: the share of railway transport increased, while the share of road and air transport decreased. The air transport sector recorded the highest losses: its share (four million passengers) decreased by 2/3 in comparison with 2019. The road transport sector lost 3% of the market

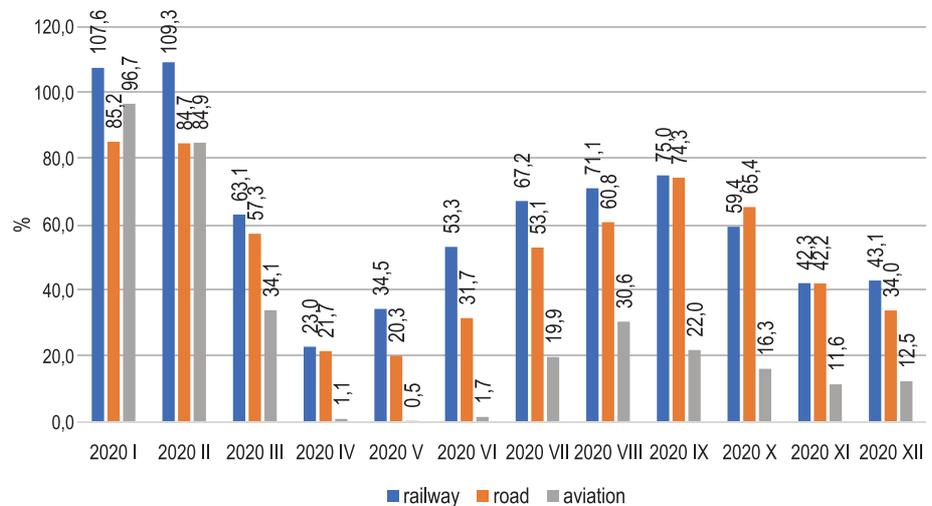


Fig. 4. Change in the number of passengers in relation to the corresponding period of the previous year; own elaboration based on [28]

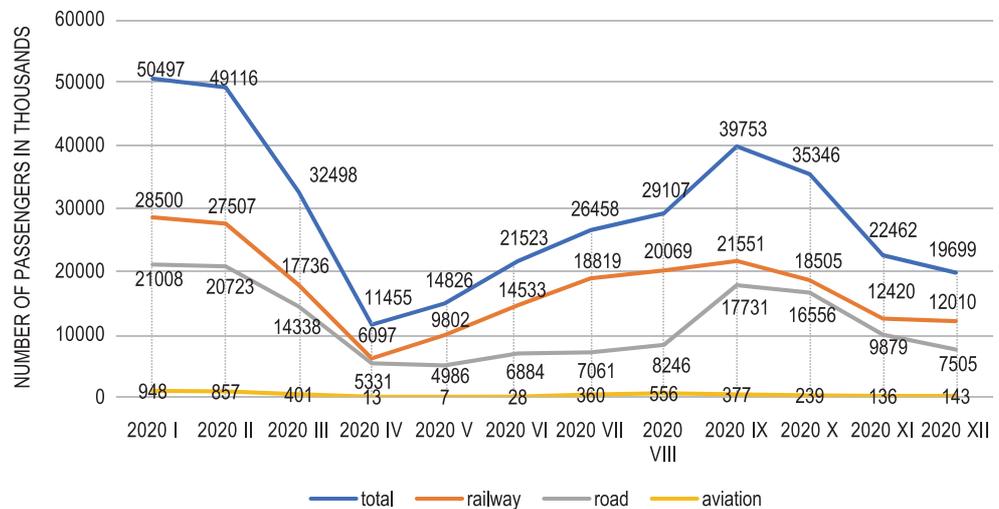


Fig. 5. Passenger transport in Poland by type of transport in 2020; own elaboration based on [28]

³ Statistical data concerns public bus transport, mass transport in cities excluded.

versus 2019 and 8% versus 2018. In spite of a major decrease in the number of passengers traveling by train (only 207 million), the share of the railway transport sector in the market increased by 5% versus 2019 and by 10% versus 2018 [28]. Figures 6, 7, and 8 present the modal share in Poland for the years 2018, 2019, and 2020, respectively. Due to the share of water transport being marginal, it has been omitted.

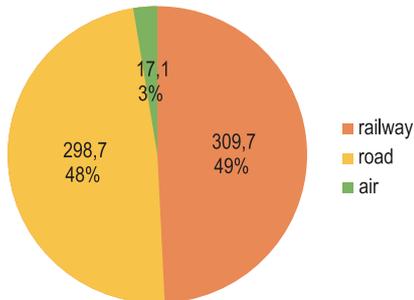


Fig. 6. Modal share in Poland in 2018; number of passengers in millions; own elaboration based on [28]

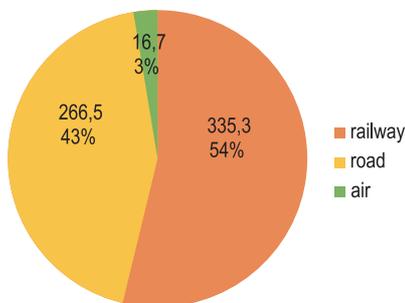


Fig. 7. Modal share in Poland in 2019; number of passengers in millions; own elaboration based on [28]

The changes related to the need to contain the spread of the virus were reflected in the distances traveled by passengers. Long-distance business trips and holiday excursions were limited to a large extent. During the year, changes were observed in terms of

the average distance traveled by a passenger by rail in comparison with 2019. The largest difference (nearly 30%) was recorded in April 2020 when a restrictive travel ban was in force in Poland (Fig. 9).

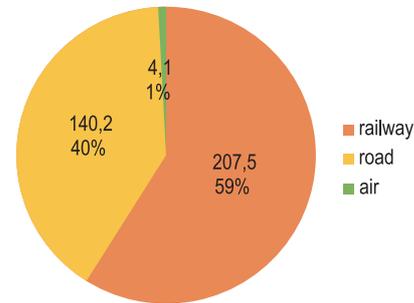


Fig. 8. Modal share in Poland in 2020; number of passengers in millions; own elaboration based on [28]

4. Changes on the Polish market of passenger transport in 2020

The development of the COVID-19 situation and the need to contain the spread of the SARS-CoV-2 resulted in many countries introducing significant mobility restrictions. In Poland, the restrictions had the greatest impact on passenger transport; all of the Polish railway carriers suffered to a smaller or larger degree as a result of the restrictions and the stay-at-home recommendation. Operational work measured through the number of train-kilometers diminished by 6.29% and transport work measured in passenger-kilometers decreased by a staggering 42.65% in comparison with 2019. The falls in terms of the volume of transport, especially during the first wave of the pandemic, affected the results recorded by carriers. The actions taken in mid-March 2020, intended to contain the spread of the coronavirus, were strongly reflected in particular in the results of transport companies engaging in international transport. The closing of

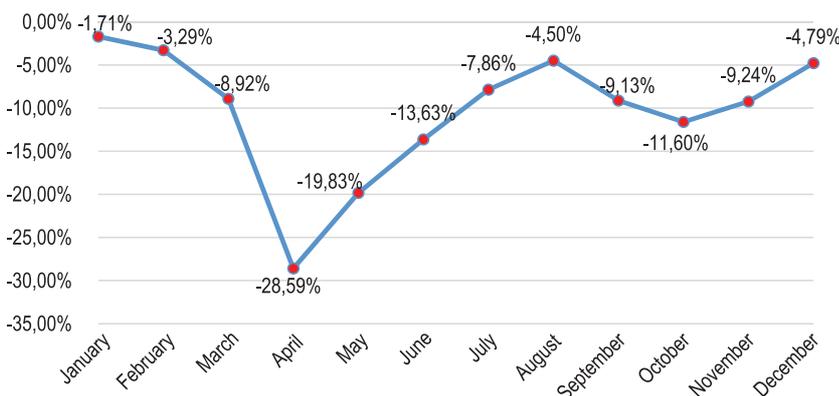


Fig. 9. Changes to the average distance traveled by a single passenger in 2020/2019; own elaboration based on [29]

borders and the subsequent restrictions in terms of crossing them resulted in carriers providing services exclusively in the area of international transport, i.e. Leo Express⁴ and UBB⁵, suspending their services in Q2 2020. In the same period, PKP Intercity S.A. also recorded a drastic fall in the volume of transport caused by the obligation to limit operations to domestic transport and reduce the number of long-distance connections. The worst period on the railway market of passenger transport was Q2 2020. The decrease of the number of passengers in April 2020 amounted to 66% in comparison with March 2020. POLREGIO turned out to be the most resilient company, as it operates mainly in the regional dimension where its offer is more stable than the offer of private bus operators. Figure 10 presents the market shares of carriers according to the number of passengers in 2020.

4.1. Regional transport

POLREGIO (formerly: the Regional Transport Company) is the largest carrier providing regional transport services in Poland. Prior to the pandemic, the company, which cooperates with carriers based in neighboring countries, offered cross-border connections as well. However, most of them were suspended in March; some of those connections were not brought back before the end of 2020. In 2020, the share of POLREGIO in the market of railway passenger transport, measured through the number of passengers, amounted to 26.65%. POLREGIO transported the largest number of passengers of all domestic carriers and slightly increased its share (by 0.2%) versus 2019. However, in spite of achieving the best result on the market of passenger transport, the company still recorded a decrease of more than 37% (33 million passengers) in comparison with 2019. The company's relatively good result was related to a higher stability of its offer in comparison with the services offered by private bus operators in the regions (which were subject to different restrictions than public railway transport). Changes of POLREGIO's market share in the particular months of 2019 and 2020 are presented in Figure 11.

Population mobility restrictions caused a significant decrease in terms of transport work at POLREGIO. In 2020, the volume of that work was 2,769,000,000 passenger-kilometers, i.e. nearly 40% more than in 2019. This shrunk by 1,690,000,000 passenger-kilometers. The volume of transport work of POLREGIO between 2015 and 2020 is presented in Figure 12.

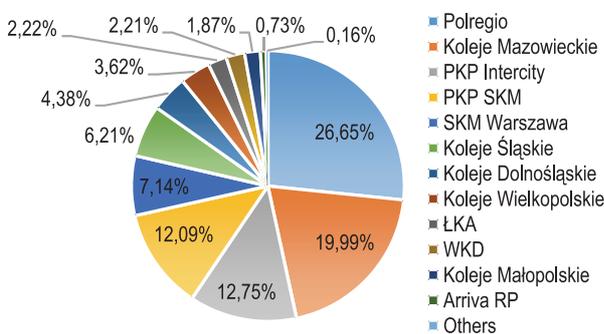


Fig. 10. Shares of RUs in terms of the number of passengers in 2020; own elaboration based on [2]

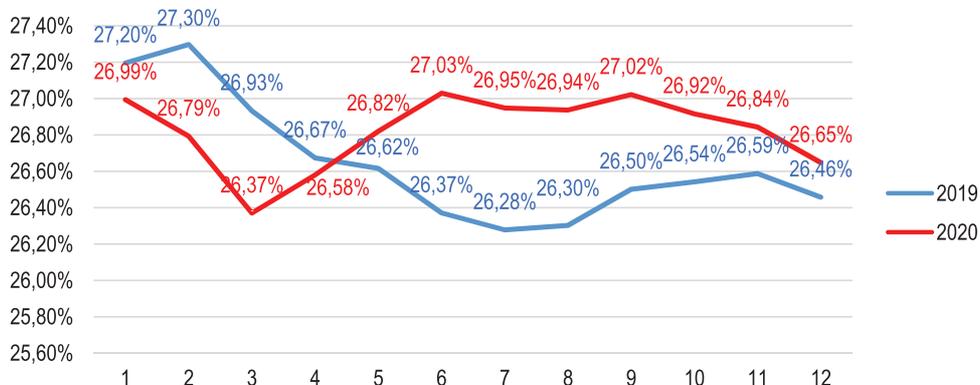


Fig. 11. POLREGIO's market share in terms of the number of passengers in 2019 and 2020; own elaboration based on [2]

⁴ Leo Express Global a.s. is a Czech private railway operator that provides services in Poland on the Zbrzydowice – Kraków and Międzyzlesie – Wrocław routes.

⁵ Usedomer Bäderbahn GmbH (the Usedom Seaside Railways) is a company that provides transport services on the Świnoujście – Stralsund route.

In 2020, the volume of operational work decreased by approx. 2,500,000 train-kilometers in comparison with 2019. Changes of this volume for POLREGIO between 2015 and 2020 are presented in Figure 13.

In spite of the difficult conditions in 2020, POLREGIO generated a revenue of PLN 1.5 billion and a net profit of PLN 23 million. The company's financial indebtedness decreased by more than PLN 30 million and the costs of operations by a further PLN 11 million [22].

4.2. Long-distance transport

The largest Polish long-distance carrier, PKP Intercity, which since 2016 had been recording increases in the volume of operational and transport work, suffered a decrease in these areas of 9.45% and 47.2%, respectively, as a result of the temporary mobility restrictions introduced by the Polish government. The significant difference between these losses were related to a drastic decrease in the number of passengers permitted on a train⁶. A comparison of the operational work between 2015 and 2020 is presented

in Figure 14, while the volume of transport work between 2015 and 2020 is shown in Figure 15.

In comparison with the previous year, the number of passengers traveling with PKP Intercity in April 2020 fell by 22.2 million, i.e. by 45.4%, which means a decrease of 90% versus April 2019. A slow recovery started as the restrictions were lifted at the end of May. During the summer holidays, connections with attractive resorts were launched and the situation stabilized somewhat. In autumn, in connection with the second wave of the pandemic, the numbers of passengers again decreased significantly: in November and December, they were more than 50% lower than in the corresponding months of 2019. Ultimately, in 2020, 26.7 million passengers used PKP Intercity trains. The average distance traveled by an Intercity train passenger was approx. 230.6 km and was lower by 7.7 km (3.2%) than in 2019. PKP Intercity's share in the market of railway passenger transport fluctuated, depending mainly on the current mobility restrictions, the limitations imposed on enterprises providing accommodation services, and the restrictions in terms of access to recreation and sport. The lowest values were



Fig. 12. The volume of POLREGIO's transport work between 2015 and 2020; own elaboration based on [9, 10, 21, 31]

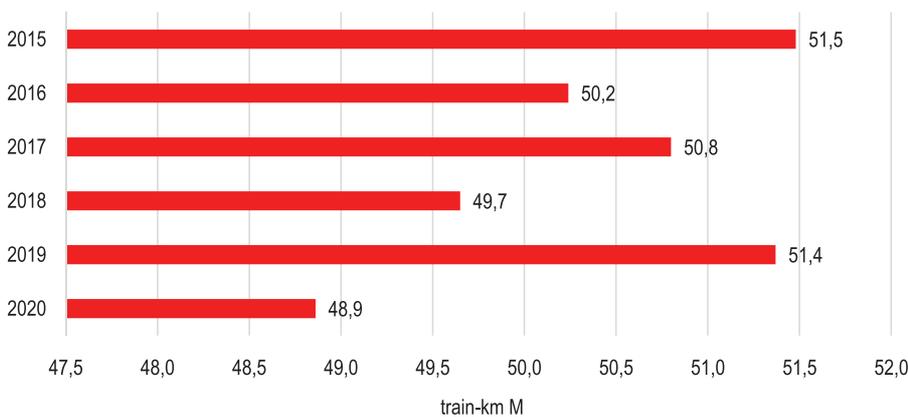


Fig. 13. The volume of POLREGIO's operational work between 2015 and 2020; own elaboration based on [9, 10, 21, 31]

⁶ The administrative restrictions consisted in a prohibition of selling more than 50% of the tickets for any given train.

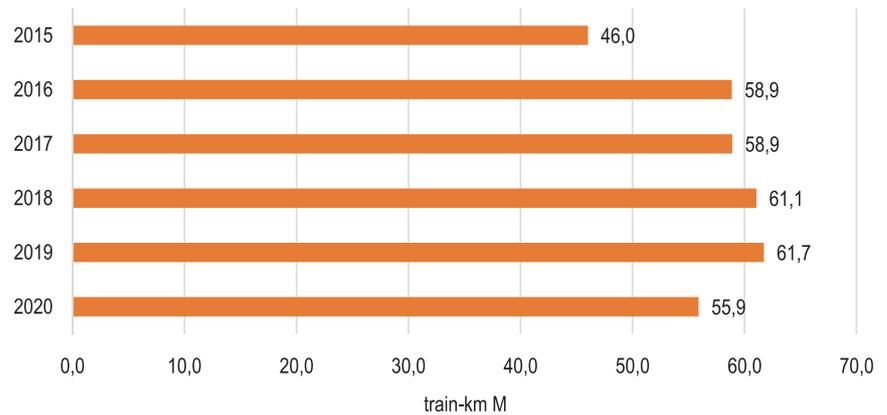


Fig. 14. Changes to the volume of PKP Intercity's operational work between 2015 and 2020; own elaboration based on [9, 10, 21, 31]

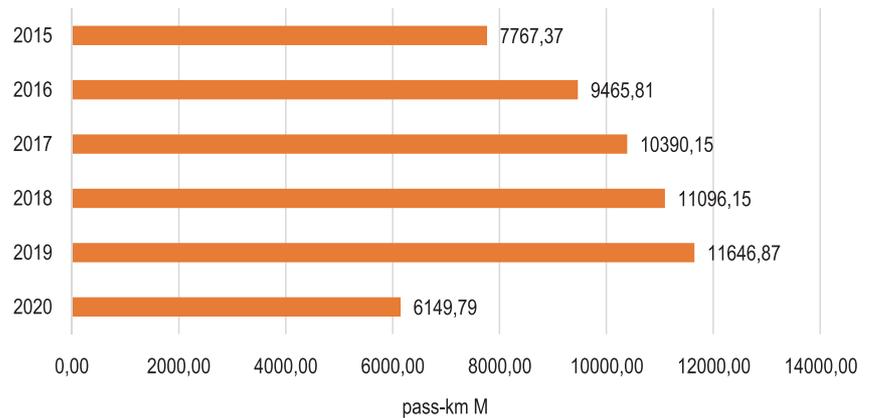


Fig. 15. Changes to the volume of PKP Intercity's transport work between 2015 and 2020; own elaboration based on [9, 10, 21, 31]

reached in May and June 2020: 11.97% and 11.96%, respectively. Figure 16 presents the changes to the share of PKP Intercity in the market of railway passenger transport in 2019 and 2020.

In response to the dynamically changing situation on the transport market, the company took a number of actions in order to adjust its services within what was legally permitted and considering the needs generated by the pandemic. From 10 March 2020, on all trains running on international routes, the employees

of PKP Intercity collected from and distributed to the passengers location cards that were intended to help in detecting the potential sources of infection [23]. In connection with the announcement in Poland of a state of an epidemic threat [26], from 17 March 2020, catering services were no longer offered: in electric trains, all services were suspended and in traditional carriage trains, food-serving carriages were not included in the train [6]. When a state of an epidemic was introduced [25], the number of connections was

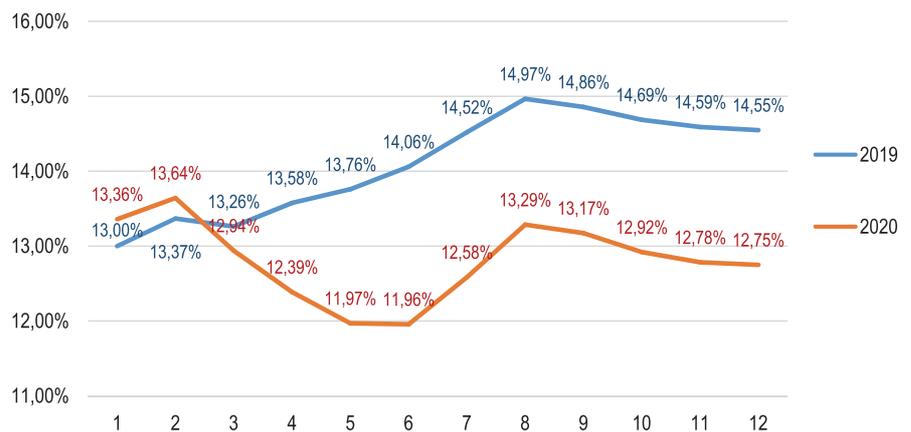


Fig. 16. PKP Intercity's market share in terms of the number of passengers in 2019 and 2020; own elaboration based on [2]

drastically reduced (174 were shut down) and the scope of PKP Intercity's services in terms of sending packages via train attendants and in terms of luggage storage at the Central Railway Station in Warsaw was limited [24].

The changes also meant that from 4 June 2020, all seats on all of trains launched by PKP Intercity had to be booked in advance [32]. Irrespective of the actions intended to increase sanitary safety, PKP Intercity supported Poles through its engagement in the campaign of bringing Poles home from abroad. During the initial stage of the COVID-19 pandemic, the company transported 3,171 passengers [30].

The restrictions related to traveling that were imposed in connection with the spread of the SARS-CoV-19 coronavirus negatively affected the financial standing of PKP Intercity: in 2020, for the first time in a long time, the company recorded a loss. Net revenue on sales amounted to PLN 2,563,400,000, i.e. 13.1% less than in 2019. Operating costs in 2020 stood at PLN 2,729,500,000 and were lower by PLN 54,800,000 than in 2019, meaning a decrease of 2% [33].

5. Recapitulation and conclusions

The year 2020 brought a number of challenges and difficulties related to dynamic changes to the applicable administrative regulations. Restrictions in terms of mobility imposed on society in connection with the need to prevent the spread of the pathogen drastically decreased the number of travels. The crisis that followed the appearance of the SARS-CoV-2 coronavirus affected the transport industry, as well, and in particular the passenger sector. This was reflected in significant decrease of the number of travels by all means of transport. The air sector was affected first, with traffic virtually disappearing at the early stage of the pandemic. In railway transport, 2020 was a year of significant decreases, which reached the lowest level in spring, during the first wave of COVID-19. The summer months were a period of relative stabilization, which in the case of long-distance connections helped improve the annual results.

The reintroduction of restrictions in connection with the second wave of the coronavirus after the summer holidays again caused significant decreases of the numbers of passengers. The restrictions intended to contain the spread of SARS-CoV-2 affected the volume of transport work to a larger extent than the volume of operational work. The volumes of transport are correlated with mobility restrictions imposed on the population. Even though there are no reasons to spread among the population a belief that the possibility of infection is higher on public transport than in other situations, such a suggestion has been presented

in mass media. Consequently, it seems that it would be reasonable to attempt to present the actual state of affairs in this respect and convince Poles that traveling by train is safe even during a pandemic.

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