

A Study of Risky Behaviors among Academic Communities during the SARS-CoV-2 Pandemic

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Abstract

The global pandemic caused by SARS-CoV-2 coronavirus resulted in many recommendations and restrictions to protect human life and health from the effects of contracting this pathogen. These recommendations and restrictions have caused changes in social functioning due to the implementation of the Distance-Disinfection-Mask rule. Observance of this principle by society is related to the tendency to either pro-healthy behavior – safe or risky behavior – dangerous. Since the subject of behaviors during the SARS-COV-2 pandemic is a new issue, a study of risky behaviors during the pandemic was conducted. The article presents the results of a questionnaire on risky behaviors among an academic community during the SARS-CoV-2 pandemic. The aim of the study was to identify risky behaviors in one of the departments of a technical university located in southern Poland. The results showed that this community is prone to risky behaviors in terms of non-adherence to the obligation to cover the nose and mouth, the use of hygiene rules like disinfection of hands, telephones, and surfaces in their house and/or car.

Keywords: Risky behaviors, SARS-CoV-2 pandemic, academic community, surveys.

Introduction

In December 2019 in the city of Wuhan, an outbreak that caused severe pneumonia was reported. The disease quickly began to spread not only in China, but also throughout the whole world. In February 2020, the disease was named COVID-19, and the pathogen causing it is called SARS-CoV-2 virus (Bao et al., 2020; Del Rio and Malani, 2020; Deng and Peng, 2020). By March 2020, the virus had already spread to 84 countries worldwide. In the same month, the first case of COVID-19 in Poland was also reported. Due to the dynamic spread of the coronavirus among the population, which causes severe pneumonia and sometimes acute fatal lung failure, on March 11, 2020, the World Health Organization (WHO) declared a global pandemic caused by this pathogen (Gupta et al., 2020). On August 10, 2021, according to official data, 204 million people worldwide were infected with the coronavirus, and 4.32 million died. In Poland, however, 2.88 million citizens fell ill, and 75,285 people died due to the infection (WHO, 2021).

Since the very beginning, the coronavirus pandemic has been a phenomenon widely studied by scientists and monitored by governments around the world. In the face of the COVID-19 pandemic, many measures have been applied to minimize the spread of this extremely dangerous pathogen. In Wuhan, China, drastic measures were

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implemented to prevent the spread of coronavirus, including the introduction of a complete blockade of the city (Yan et al., 2020; Cinazzi et al. 2020). In Poland, on the other hand, the first restrictions took effect on March 10, 2020, and were associated with the cancellation of all mass events. In the following days, educational institutions, universities, and state borders were closed and on March 24, 2020, a movement ban was introduced (with a few exceptions). An important part of the introduced restrictions, both in Poland and in many countries around the world, was the obligation to cover the nose and mouth, which, as already demonstrated during previous epidemics, was an effective way to reduce the spread of viruses by air.

The restrictions introduced by the Polish government were lifted during periods of decreased infections and reintroduced during periods of increased infections.

Adherence to or disregard for the restrictions in question was due to several reasons. On the one hand, the pandemic has been questioned, and on the other hand, the approach to the consequences of contracting the disease has been minimized. It is indisputable that such a behavior should be treated as risky and dangerous to society, particularly because the effects of the pandemic became greater with time.

Since the subject of social behaviors in the face of a global pandemic (the first global pandemic in the 21st century) is a relatively new issue for contemporaries, it is reasonable to conduct research on risky behaviors among various social groups.

The article presents the results of a questionnaire on such risky behaviors among an academic community in one of the technical universities in Poland. The aim was to identify and assess risky behaviors of the community at one of the university departments. The research was carried out using the author's survey questionnaire.

The issue of risky behaviors

According to Trimpop (1994), a risky or risk-taking behavior is defined as "any consciously or unconsciously controlled behavior with perceived uncertainty about its outcome and/or possible benefits or costs to the physical, economic, or psychosocial well-being of self or others." This definition is extremely broad and covers risky behaviors in general. Depending on the field of study, there are many other definitions of risky behaviors. From an economic perspective, risk is defined in terms of the variability of possible financial outcomes, whereas in the clinical literature, risk is defined as exposure to possible loss or harm (Brodny and Tutak, 2018; Schonberg et al., 2011; Tutak and Brodny, 2019). Turner et al. (2004) defined risky behaviors as socially unacceptable with potentially negative consequences where precautions are not taken, such as speeding, driving while being drunk, drug abuse, etc., or as socially acceptable in which the presence of danger has been identified (e.g., sports – mountain climbing).

Many examples of risky behaviors can be found at workplaces, especially those that are accompanied by the occurrence of a number of different types of hazards. One of such risky industries concerns mining, where the work environment itself is burdened with many natural hazards (Brodny et al., 2018; Brodny and Tutak, 2016; Brodny and Tutak, 2019; Szurgacz et al., 2020; Szurgacz and Brodny, 2019; Tutak and Brodny, 2017; Tutak et al., 2020). Behaviors that do not respect regulations resulting from these hazards are a serious cause of many dangerous and catastrophic events. Such behaviors have also a very negative impact on the safety and effectiveness of implemented production processes (Brodny et al., 2016; Brodny et al., 2017a, Brodny et al., 2017b; Brodny and Tutak, 2017; Stecuła et al., 2017; Stecuła et al., 2018).

Risky behaviors should be considered in close relation to injuries that may result from these behaviors. It has been shown that risky behaviors are associated with a significantly higher possibility of injury than behaviors that are not commonly recognized as risky (Turner et al., 2004)

Also, risky behaviors can be a manifestation of a person's personality, which can be either risk tolerance or sensation seeking. Human risk behaviors include driving at excessive speeds or under the influence of alcohol and/or drugs (Jonah, 1997). In the case of infectious diseases, human risk behaviors have so far most often been considered in the context of HIV/AIDS transmission (Biglan et al., 1990).

Therefore, the identification of individuals who may engage in risky behaviors as well as the development and testing of interventions to prevent risky behaviors are important for the prevention of disease and adverse health outcomes at both individual and societal levels (Killianova, 2013).

In the context of risky behaviors, it should be noted that such behaviors are significantly influenced by the perception of risk. This process involves a conscious belief in potential harm or the possibility of loss. It is a subjective

evaluation of a phenomenon based on knowledge and awareness. The perception of risk includes an assessment of the likelihood and consequences of a negative event to occur. Three dimensions of risk perception can be distinguished: perception of probability (the likelihood that a person will be harmed by the activation of a hazard), perception of vulnerability (the institutional susceptibility of a person to a hazard), and perception of severity (the extent of harm that a hazard could cause) (Killianova, 2013).

Materials and Methods

With regard to the importance of human risky behaviors in the context of public safety during the SARS-CoV-2 pandemic, it was reasonable to conduct research on such behaviors among the academic community of one of the departments of a technical university located in southern Poland. The study was conducted using the author's questionnaire, which consisted of 12 closed-ended questions and included socio-demographic data of the respondents. Random sampling was used to enroll subjects in the study. The study was conducted using an electronic questionnaire in December 2020 and January 2021.

The study was conducted on a group of 100 people, including students as well as research, academic and administrative staff. The group of respondents was mostly male (54%. Table 1).

Table 1: Gender of respondents in the study group (N = 100)

	N
Females	46
Males	54
Total	100

When analyzing the status of the subjects, the largest group was made by students (74%, Table 2).

Table 2: Status of respondents in the study group (N = 100)

	N
Students	74
Employees	26
Total	100

In terms of education, most respondents had a university degree (51%), 32% – general secondary education and 17% – technical secondary education (Table 3).

Table 3: Education of respondents in the study group (N = 100)

	N
General secondary education	32
Technical secondary education	17
Higher education	51
Total	100

In terms of age, most respondents were under 25 years of age (80%) and the least number of respondents were between 51-55 years of age (1%) (Table 4).

Table 4: Age of respondents in the study group (N = 100)

	N
under 25 years	80
26-30 years	8
31-40 years	4
41-50 years	4
51-55 years	1
56 years or more	3
Total	100

Results and Discussion

The results of the research on risky behaviors among the academic community at one of the technical university departments are presented graphically in Figures 1-4.

The first question concerned the maintenance of social distance by the respondents (Figure 1a). Maintaining social distance to a very large extent was declared by 16% of the respondents, and to a large extent by 32% of the respondents. Maintaining social distance to a small and very small extent was declared by 12% and 9% of the respondents, respectively.

The next question was related to the respondents' compliance with the order to cover their nose and mouth in closed spaces and in the open air (fig. 1b). The results showed that almost half of the respondents (45%) obeyed the order to cover their nose and mouth to a very large extent and 25% of the respondents said that they obeyed this order to a large extent. Only 3% of the respondents admitted that they obeyed the order to a small extent and 7% – to a very small extent.

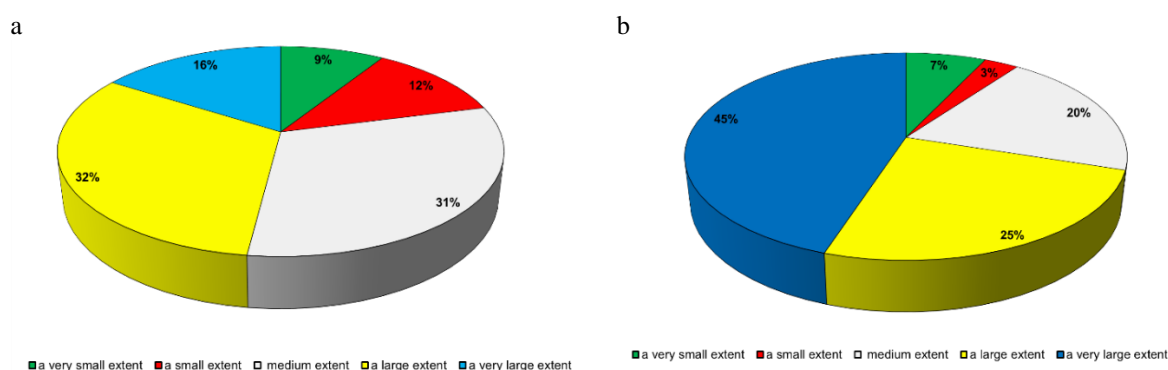


Fig 1. Summary of the results for social distance (a) and covering the nose and mouth (b)

As far as keeping social distance, staying at home and avoiding public places are concerned, 13% of the respondents followed this recommendation to a very large extent and 28% – to a large extent (fig.2a). This recommendation was followed to a small and very small extent by 20% and 9% of the respondents, respectively. With regard to limiting visits to/from friends and/or family, 13% of the respondents declared that they followed this recommendation to a very large extent and 24% – to a large degree. Only 9% of the respondents declared that they followed this recommendation to a very small extent and 21% to a small extent (Figure 2b).

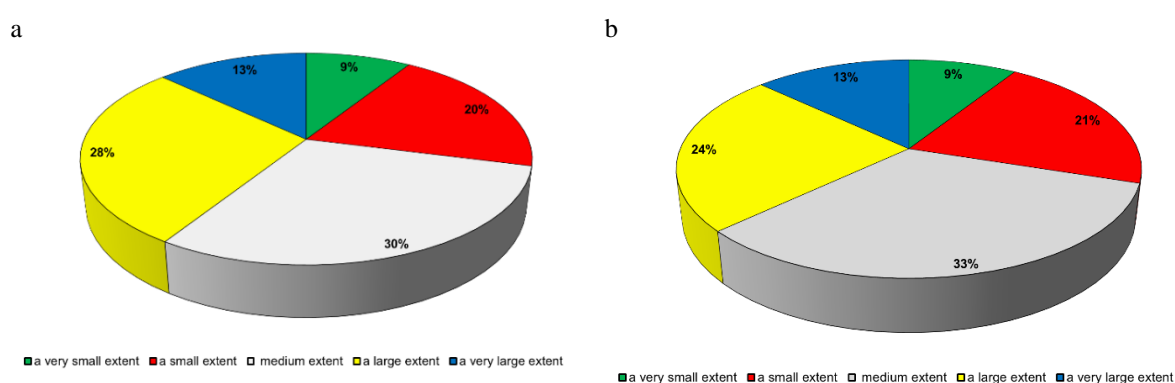


Fig. 2 Summary of the results for staying at home and avoiding public places (a) and limiting visits to/from family and friends (b)

When it comes to applying hygienic rules for hand disinfection, the respondents were asked if they followed this recommendation more often than they did before the pandemic. This activity was performed to a very large extent by 27% of the respondents and to a large extent by 27% of the respondents. By contrast, 11% of the respondents followed this recommendation to a very small extent, and 9% of the respondents followed it to a small extent. The respondents were also asked about disinfecting their cell phones (Figure 3b), door handles and/or various surfaces in their house and/or car (3c). In terms of disinfecting their cell phones, which are considered to have a microbiome

similar to their owner's and can be a means of transferring many pathogenic bacteria and viruses, 10% of the respondents said they performed this activity daily and 7% said they performed it several times a week. However, as high as 31% of the respondents never performed this activity. Even more unfavorable results concerned the behavior of disinfecting door handles and various surfaces at home and/or in a car. As much as 33% of the respondents declared that they never did it, and 43% – that they did it rarely. Disinfecting phones, surfaces and door handles several times a week was declared by 7% of the respondents.

In terms of hand disinfection before doing shopping, 29% of the respondents claimed they did it every time and 26% – often. 7% of respondents never disinfected their hands before doing shopping (Figure 3d). After leaving the store, 18% of the respondents disinfected their hands every time and often, and 19% – never (Figure 3e).

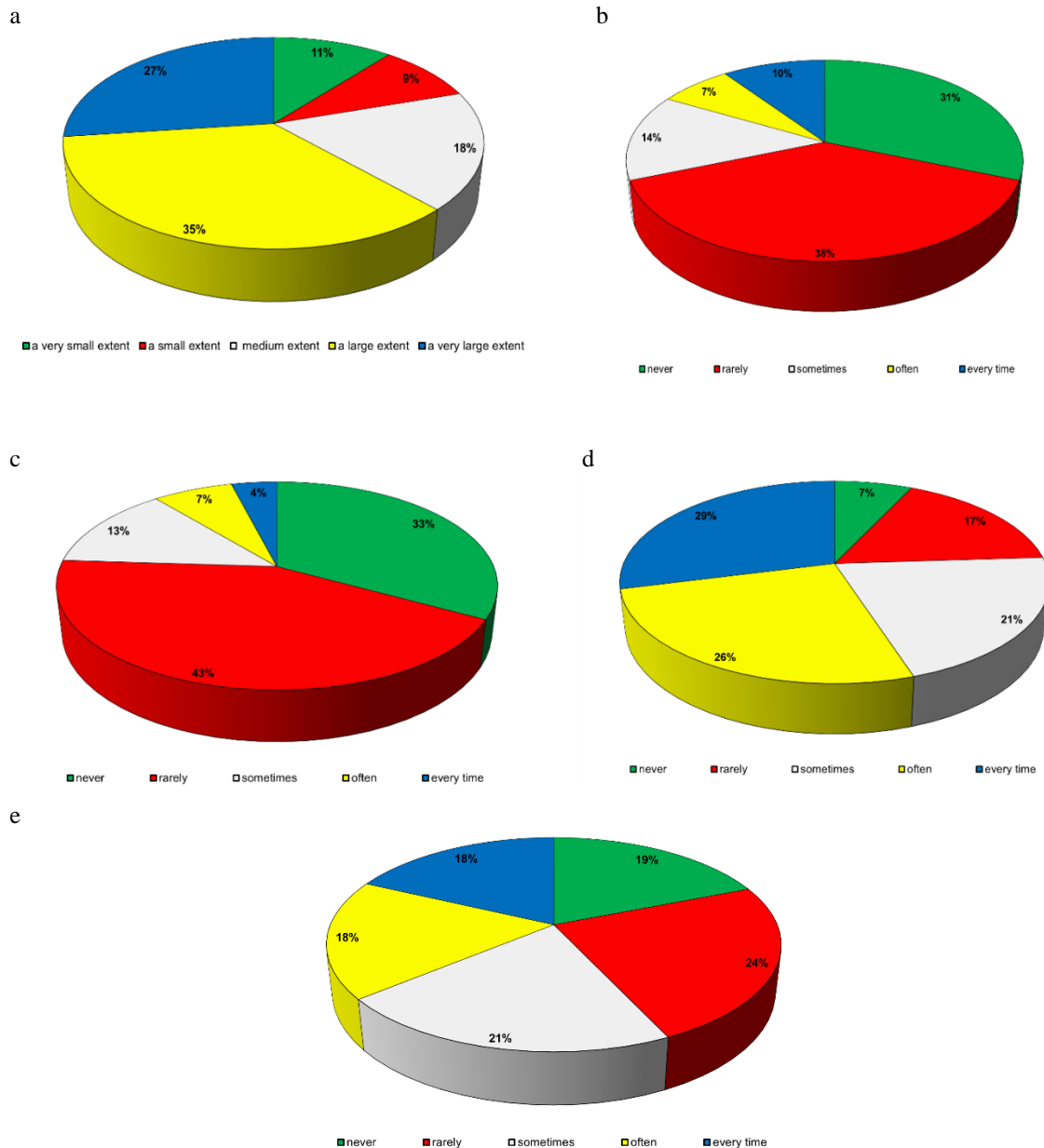


Fig. 3: Summary of the results for disinfection of: hands in general (a), door handles and various surfaces (b), telephone (c), hands before doing shopping (d), and hands after doing shopping (e)

Another question was about giving up the habit of shaking hands when greeting another person (fig 4a). As high as 25% of the respondents stopped it to a very large extent and 22% – to a large extent. 13% of the respondents stopped it to a very small extent and 12% – to a small extent. As far as respondents' behavior during payment in stores is concerned, 44% of them declared that they made non-cash payments every time and 46% – often (fig.

4b). When it comes to putting on disposable gloves while doing shopping (Figure 4c), as high as 45% of the respondents did so very rarely and 21% did so rarely. Gloves were worn often and very often by 6% and 2% of the respondents, respectively.

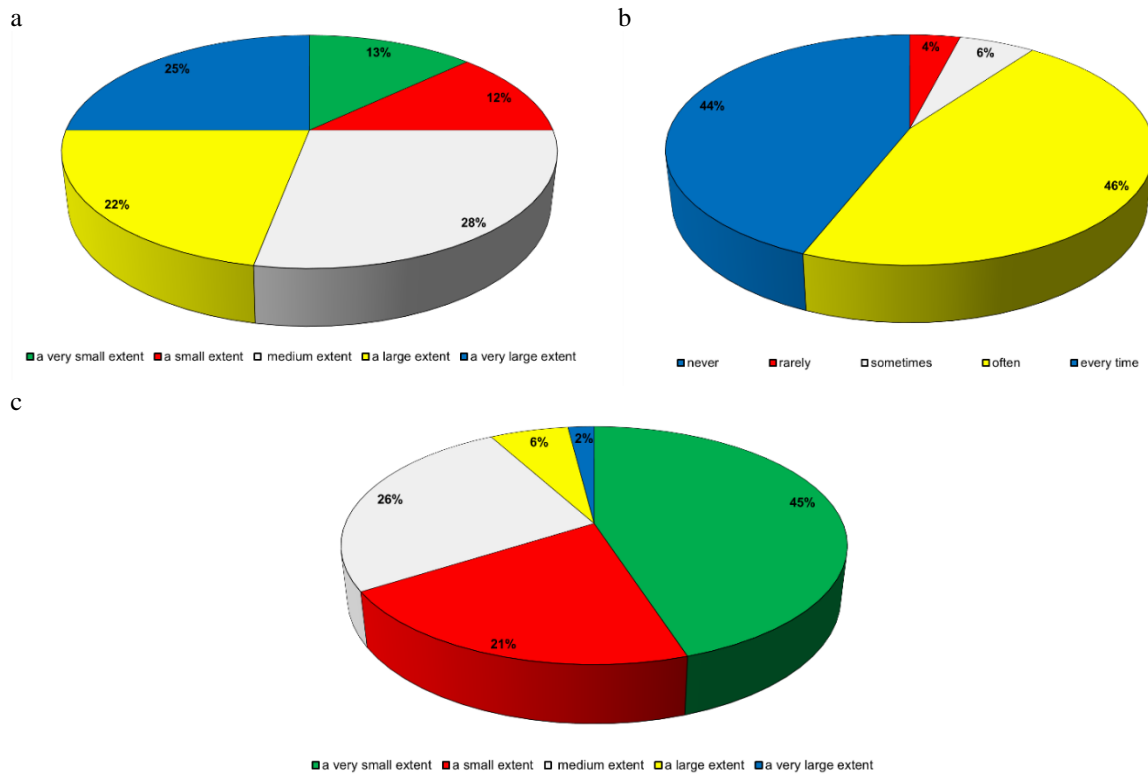


Fig. 4: Results for not shaking hands when greeting another person (a), making non-cash payments when doing shopping (b) and wearing disposable gloves when doing shopping (c)

In the next stage of the study, the results were evaluated using a 5-point scale. It was assumed that if the first (to a very small extent, never) and second (to a small extent, rarely) answers were given by more than 50% of the respondents, such a behavior was included in the category of unfavorable behavior, that is risky. The sum of the answers with a value of 4 (to a large extent, often) and 5 (to a very large extent, every time) given by over 50% of the respondents was an indicator of safe behavior. The remaining answers with a value of 3 (to a medium extent, sometimes) indicated behaviors close to risky behaviors. Table 3 presents all scores obtained for each question.

When analyzing the results, it was found that among all the studied behaviors of the academic community, risky behaviors consisted of those related to obeying the order to cover the nose and mouth, applying hygienic rules for disinfecting hands, telephones and surfaces in the house and/or car. Safe behaviors, on the other hand, consisted of disinfecting hands before doing shopping in a store and making non-cash payments. Medium risk behaviors (close to risky ones) included keeping social distance, staying at home and avoiding public places, minimizing visits to/from friends and/or family, disinfecting hands after doing shopping, and not shaking hands when greeting another person.

Table 5: Behavior assessment

Question (number)	Low-risk behavior – safe behavior	Medium-risk behavior – close to risky behavior	High-risk behavior – risky behavior
Maintaining social distance (1)	21	31	48
Complying with the order to cover your mouth and nose (2)	10	20	90
Maintaining social distance, staying at home and avoiding public places (3)	29	30	41
Limiting visits to/from friends and/or family (4) (4)	30	33	37
Appling hygienic rules for hand disinfection (5)	20	18	62
Phone disinfection (6)	17	14	69
Disinfecting door handles and/or various surfaces in your house and/or car (7)	11	13	76
Hand disinfection before doing shopping in a store (8)	55	21	24
Hand disinfection after doing shopping in a store (9)	36	21	43
Not shaking hands when greeting another person (10)	47	28	25
Making non-cash payments (11)	90	6	4
Wearing disposable gloves while doing shopping (12)	8	26	66

Conclusions

The announcement of the global pandemic caused by the coronavirus SARS-CoV-2 contributed to the introduction of many recommendations and restrictions aimed at protecting human life and health from the effects of contracting this pathogen. These actions have led to changes in social functioning. In particular, the recommendations of the Distance-Disinfection-Mask rule, which can be considered a health-promoting, and thus safe, low-risk behavior, have been important.

The study, which aimed to identify and evaluate risky behaviors during the SARS-CoV-2 pandemic in the academic community, showed that this community is characterized by a tendency to risky behaviors, such as non-adherence to nasal and mouth covering, hygiene practices such as hand, phone, and surface disinfection in the house and/or car. Safe behaviors, on the other hand, included disinfecting hands before doing shopping in a store and making non-cash payments, and medium-risk behaviors included keeping social distance, staying at home, avoiding public places, limiting visits to/from friends and/or family, disinfecting hands after doing shopping in a store, and giving up the habit of shaking hands when greeting another person.

In conclusion, despite good education and, consequently, high social awareness of the studied group, the results are not very optimistic in terms of behavior in the context of protection against the SARS-CoV-2 infection.

The conducted research and obtained results constitute new knowledge in the field of risky behaviors of the academic community during the global pandemic caused by the SARS-CoV-2 coronavirus.

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References

- Bao Y., Sun Y., Meng S., Shi J. and Lu L. (2020), '2019-nCoV epidemic: address mental health care to empower society', *Lancet*, 395 (10224), 37-38.
- Biglan A., Metzler C. W., Wirt R., Ary D., Noell J., Ochs L., French C. and Hood D. (1990), 'Social and behavioral factors associated with high-risk sexual behavior among adolescents', *Journal of Behavioral Medicine*, 13, 245–261.
- Brodny J. and Tutak M. (2016), 'Analysis of gases emitted into the atmosphere during an endogenous fire,' International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM Volume 3, Issue BOOK 4, Pages 75 - 822016 16th International Multidisciplinary Scientific GeoConference, SGEM 2016, Vienna, 2 November 2016 - 5 November 2016, 124226.
- Brodny, J., Stecula, K. and Tutak M. (2016), 'Application of the TPM strategy to analyze the effectiveness of using a set of mining machines,' 16th International Multidisciplinary Scientific GeoConference SGEM2016. ISBN 978-619-7105-55-1 / ISSN 1314-2704, 65–72.
- Brodny J., Tutak M. and Michalak M. (2017a), 'A Data Warehouse as an Indispensable Tool to Determine the Effectiveness of the Use of the Longwall Shearer,' Kozielski S., Mrozek D., Kasprowski P., Małysiak-Mrozek B., Kostrzewa D. (eds) Beyond Databases, Architectures and Structures. Towards Efficient Solutions for Data Analysis and Knowledge Representation. BDAS 2017. Communications in Computer and Information Science, vol 716. Springer, Cham.
- Brodny J., Tutak M. and Michalak M. (2017b), 'The Use of the TGŚP Module as a Database to Identify Breaks in the Work of Mining Machinery', Kozielski S., Mrozek D., Kasprowski P., Małysiak-Mrozek B., Kostrzewa D. (eds) Beyond Databases, Architectures and Structures. Towards Efficient Solutions for Data Analysis and Knowledge Representation. BDAS 2017. Communications in Computer and Information Science, vol 716. Springer, Cham.
- Brodny J. and Tutak M. (2017), 'Use of it platform in determination of efficiency of mining machines,' *E3S Web of Conferences*, Vol. 29, Article number 00014.
- Brodny J. and Tutak M. (2018), 'Analysis of methane hazard conditions in mine headings', *Tehnicki Vjesnik*, 25(1), 271
 - 276. DOI: 10.17559/TV-20160322194812.
- Brodny, J., Tutak, M., John, A. (2018), 'The impact of airway geometry on the distribution of methane concentrations at the outlet from a longwall,' *Mechanika*, 24(5), 695-702.
- Brodny, J. and Tutak, M (2019), 'Forecasting the distribution of methane concentration levels in mine headings by means of model-based tests and in-situ measurements,' *Archives of Control Sciences*, 29 (1), 25-39.
- Cinazzi M., Davis J., Ajelli M., Gioannini C., Litvinowa M., Merler S., Piontti A., Mu K., Rossi M., Sun K., Viboud C., Xiong X., Yu H., Halloran E., Longini I. and Vespignani A. (2020), 'The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak', *Science*, 368, 6489.
- Del Rio C. and Malani P.N. (2020), 'COVID-19-New insights on a rapidly changing epidemic', *J Am Med Assoc.*, 323, 1339-1340, DOI: 10.1001/jama.2020.3072.
- Deng S.Q. and Peng H.J. (2020), 'Characteristics of and public health responses to the coronavirus disease 2019 outbreak in China,' *J Clin Med.*, 20;(2):9. doi: 10.3390/jcm9020575. E575.
- Gupta R., Ghosh A., Singh A.K and Misra A. (2020), 'Clinical considerations for patients with diabetes in times of COVID-19 epidemic,' *Diab Metab Syndr*, 14, 211-212.
- Jonah B. A. (1997), 'Sensation seeking and risky driving: A review and synthesis of the literature', *Accident Analysis and Prevention*, 29, 651–665.
- Killianova T. (2013), 'Risky Behavior', In: Gellman M.D., Turner J.R. (eds) Encyclopedia of Behavioral Medicine. Springer, New York, NY. https://doi.org/10.1007/978-1-4419-1005-9_1551.
- Schonberg T., Fox C. R. and Poldrack R. A. (2011), 'Mind the gap: Bridging economic and naturalistic risk-taking with cognitive neuroscience', *Trends in Cognitive Sciences*, 15(1), 11–19.

- Stecula, K., Tutak, M., and Brodny, J. (2017), Application of chosen elements from Japanese production and maintenance management philosophies in Polish coal mines. 17th International Multidisciplinary Scientific Geoconference, SGEM 2017, ISBN 978-619-7105-00-1 / ISSN 1314-2704, 93-100.
- Stecula K., Brodny J., and Tutak M. (2018), Use of intelligent informatics module for registration and assessment of causes of breaks in selected mining machines. Burduk A., Mazurkiewicz D. (eds) Intelligent Systems in Production Engineering and Maintenance – ISPEM 2017. ISPEM 2017. Advances in Intelligent Systems and Computing, vol 637. Springer, Cham.
- Szurgacz D. and Brodny J. (2019), ‘Tests of geometry of the powered roof support section’, *Energies*, 12, 3945,
- Szurgacz D., Tutak M., Brodny J., Sobik L. and Zhironkina O. (2020), ‘The method of combating coal spontaneous combustion hazard in goafs-a case study,’ *Energies*, 13, 4538.
- Trimpop, R. (1994), ‘The psychology of risk taking behavior’, Amsterdam: Elsevier Science.
- Turner C., McClure R., and Pirozzo S. (2004), ‘Injury and risk-taking behavior-a systematic review’, *Acci-dent Analysis and Prevention*, 36, 93–101.
- Tutak M., Brodny J., Szurgacz D., Sobik L., and Zhironkin S. (2020), ‘The impact of the ventilation system on the methane release hazard and spontaneous combustion of coal in the area of exploitation— A case study,’ *Energies*, 13, 4891.
- Tutak M. and Brodny J. (2019), ‘The impact of the strength of roof rocks on the extent of the zone with a high risk of spontaneous coal combustion for fully powered longwalls ventilated with the Y-type system-A case study,’ *Applied Sciences*, 9, 5315.
- Tutak M. and Brodny J. (2017), ‘Determination of Particular Endogenous Fires Hazard Zones in Goaf with Caving of Longwall,’ *IOP Conference Series: Earth and Environmental Science*, 95(4), 133094. DOI: 10.1088/1755-1315/95/4/042026.
- WHO. Coronavirus Disease (COVID-19) Pandemic. Available online: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019> (30.07.2021)
- Yan A.F., Sun X., Zheng J., Mi B., Zuo H., Ruan G., and Shi Z. (2020), ‘Perceived risk, behavior changes and health-related outcomes during COVID-19 pandemic: findings among adults with and without diabetes in China’, *Diabetes Res. Clin. Pract.*, 167, Article 108350, 10.1016/j.diabres.2020.108350.