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Risks of Transportation at Public University in Central Mexico

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Abstract

This study aimed to conduct a thorough review of existing literature to shed light on the policies of metropolitan mobility and peri-urban health. The focus was on the impact of public transport safety on the health of its users. The study was conducted using a documentary, retrospective, and meta-analytic approach with a non-probabilistic selection of indexed sources published between 2020 and 2023. The study searched for keywords and analyzed the prevalence of data that support non-exposure to risk events that derive from mobility policies in public transport safety, and their impact on the health of users. The study also compared different policies to reveal how they prevent the effects of risk events on the health of users. The findings indicate that mobility policies that prioritize transport safety do not recognize the risks of exposure and their short-term, medium-term, and long-term consequences on the health of users.

Keywords - Mobility, public transport, security, meta-analysis, governance

Introduction

The safety of crime in public transport suggests the implementation of policies, strategies, and programs for the prevention of crime and prosecution of risk events that could be exacerbated by negligence, corruption, nepotism, opacity, or incompetence of the authorities as guarantors of the civil protection [1]. In the context of crime safety in public transport, the state has generated public opinion currents that legitimize its administration in the management and administration of public mobility through investments in video systems: security, training of specialized police or programs, checkpoints, and assistance in tolls, cabins, federal roads, and bridges.

However, robberies, kidnappings, accidents, and aggressions against users have generated counter propaganda that not only discredits the rector of the State but also replaces it with a system of citizen self-management that consists of the prevention of crime through the dissemination of alleged criminals, routes of fear or police corruption, as well as the systematic denunciation through testimonies and video recordings before the media, while self-defense actions such as the capture of delinquents or lynchings are gestated [2].

The Metropolitan Area of the Valley of Mexico is concentrated in most of the public transport, but only in Mexico City 80% for 45% of users and 55% mobilize in motor transport. In contrast, the State of Mexico, located around Mexico City, concentrates 20% of public transportation for 55% of its inhabitants in Mexico City. This is an imbalance that translates into the state of Mexico

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and Mexico City. In this way, Mexico City receives around one million 735 thousand workers and students from the State of Mexico (one million 676 thousand), Hidalgo (28 thousand), Morelos (14 thousand), and Puebla (15 thousand). However, the complaints regarding insecurity have decreased. In 2012, 2441 complaints were lodged, but in 2018 only 1564 were processed. In the Metropolitan Zone of the Valle México (ZMVM) about 45% of the vehicle fleet shuttle is public transport private car followed by 29% and taxi use by 11%. Inflation (4% accumulated during 2013) of gasoline has increased by 40%, premium by 30%, diesel by 48%, and salary only increased by 28%. Mexico City occupies the last place in terms of pedestrian movement with a figure of around 2%, followed by New York City with 10% and the City of London with 20% while in the city of Bombay, 55% of the deployments are on foot.

In the family economy, transportation expenses are divided into 50% for buses or minibuses, 30% for urban buses, 16% for radio taxis, and 2% for the metro [3]. In this context, it is possible to notice that the sustainability of public transport implies establishing a collection system according to peri-urban mobility capacities. In 2012 there were around 580 robberies by 2015 had increased to 600 thousand assaults in public, private, and concessioned transport. In the cases by distinction, 22% of the cases were registered in the Coyoacán delegation, followed by Gustavo A. Madero with 15% of the cases, Iztapalapa with 14%, and Venustiano Carranza with 12% of the crimes.

However, public transportation in cities in Mexico is considered unsafe. It is estimated that in the last eight years around 20% of users have stopped transporting in the public system, considering it highly dangerous in Mexico City. In 2011, 78% of respondents said they felt unsafe in public transport and by 2015 this increased to 80% of respondents. In 2012, the minibus with 1394, followed by the taxi with 641, and the metro with 404 crimes were the scenarios of greatest insecurity. In 2015, 983 cases occurred in the minibus, 340 in the metro, and 241 in taxis.

These data exemplify the volume of governance or coordination between political and civil actors, and public and private sectors around security, even though statistics highlight the reduction of complaints, crimes seem to hide the discourses surrounding the problem since the reduction of complaints does not imply a reduction of crimes or a civil trust in the authorities [4].

Therefore, this paper aims to carry out a meta-analysis of the literature related to safety or insecurity as a result of exposure or non-exposure of public transport users and their impact on their physical or emotional integrity registered in 2019 to 2023. From a meta-analytical approach, it will be possible to observe the effects of safety or insecurity on the health of users to adjust mobility policies and the public administration of the system, as well as citizen self-management.

Unlike the public policies of public transport that emerge from the discretion of authorities and advisors, meta-analytic approaches reveal the retrospective conditions of exposure or not to security or insecurity and its effects on the users of a system [5]. In the construction of an agenda on mobility in public transport, the meta-analytic approach suggests a systematic review of the literature that reports the effects of exposure or not of risk events such as accidents or diseases associated with crime, corruption, extortion, negligence, opacity or nepotism of the authorities and whose effects are observed in the mental and physical health of the users.

In such a scenario of exposure to risk events such as earthquakes, fires, coalitions, floods, or landslides exacerbated by government action or inaction, public insecurity is created whose effects on the health of users have been recorded to establish the conditions of relative risk

and proportion of indispensable probabilities to build Metropolitan governance [6]. This is a scenario in which social diagnosis, civil protection, and evaluation of such intervention are convenient. In virtue of this, the development of an integrative model of state management and social self-management is indispensable to reach agreements between the parties involved.

The mediation of public policies and social needs suppose differences between political and social actors. This is because the inclusion of citizens in the political sphere and the inclusion of rulers in civil affairs is increasingly necessary [7]. That is, a meta-analysis of the effects of risks in public transport on the health of users is a diagnostic that guides the strategies among civil society to achieve the sustainability of a system. Metropolitan governance and its public agenda are geared towards socio-state co-management, affirming more similarities than differences between authorities and users of public transport, although the establishment of tariffs seems to be a pending issue between the government and citizens since Subsidies will prevail to the extent that the quality of the service is low.

Even though safety and quality in public transport is an objective, a task, and a common goal among political and social actors, the differences between the rates of the city center concerning the periphery, as well as the deregulation of transport [8], discretionary concessions and the deterioration of public transport units affect the health of users and seem to show that there is ungovernability and the impossibility of governance or management and administration agreed between civil society and the State.

Literature consults focus its interest on the effects of public policies whose dimensions it places between acultural, multicultural, multicultural, intercultural, and transcultural [9]. The reviewed publications suggest that the acultural, multicultural, and multicultural policies are linked to the cases of exposure and non-exposure without health consequences, since they highlight the rector of the State and the efficient administration of the system, legitimizing increases to the public service without corresponding to the quality and safety of them.

The acultural policy is distinguished from the multicultural and multicultural in privileging the native communities that inhabit the cities concerning the migrant flows that go from the urban periphery to the urban centrality [10]. This is the case of availability, quality, and transport subsidy, which in the centrality is two or three times greater than the cost, availability, and quality of transport in the periphery.

The multicultural policy recognizes the arrival of migrant flows for labor or educational reasons but does not subscribe to these sectors and only guarantees its security with the video surveillance system that prevails in urban centrality [11]. That is, it responds to complaints but does not follow up on them or seek a comprehensive resolution to the problem, justifying its inaction due to the lack of complaints or endorsing its responsibility to individuals, promoting austerity so as not to attract the attention of the offender.

Multicultural policies on public transport highlight coexistence and order as central premises between migratory flows and native communities but adjust the uses and customs of visitors to the laws of urban centrality [12]. In this way, a crime committed in a unit that goes from the periphery to the centrality is considered a responsibility of the federal rather than local authority. Or, the demarcation of responsibility before the deregulation of transport in the urban periphery.

In contrast, public mobility policies from intercultural and transcultural approaches highlight the exposure and non-exposure of users to risk events derived from climate change and

exacerbated by local corruption with short, medium, and long-term sequels in mental health and physics of the users, reflecting in the distrust towards their authorities and the conflicts with the dependencies of government in charge of the management and administration of the system [13].

The intercultural policy seeks co-responsible administration between the government entities of centrality and periphery, preventing and imparting justice to crimes committed in the public transport system and assistance to victims of risk, corruption, and crime, but considering a dialogue permanent relationship between government and education and labor sectors, syndicates and civil organizations for the improvement of the quality and security of the system [14].

Based on the increase in risk events and corruption, the cross-cultural policy seeks to reduce risks in public transport based on the elimination of administrative boundaries for decentralization and investment; generating opportunities for health, education, and employment in the periphery; training employees and police, as well as promoting lives free of violence and risks to users [15]. Based on these distinctions, it is possible to notice that the literature seems to focus on the effects of multicultural and cross-cultural policies that recognize user exposure to risk and corruption but do not know or recognize minimal sequelae in their mental and physical health, directing their speeches towards the subdistrict to attend to the well-being of the user.

Studies related to public transport focus on the subjectivity of authorities and users when evaluating the quality and security of public resources and services from their perceptions.

Additional properties are differences between users over conventional transport about public transportation called sustainable [16]. They also found significant differences between the uses of electricity optimization vehicles and hydrocarbons. Regarding the perceptions of the genders regarding the tariffs and environmental impact of transport in general, they also found differences. However, about high, medium, and low incomes, the differences were confined to the use of bicycles, rickshaws, motorcycles, and trolleys.

Public transport was established as multidimensional due to its sociopolitical context and the daily use of university, has shown hypotheses concerning ecocentric knowledge and its impact on the perceptual differences between men and women complement the above findings [17]. The differences that stand out in the studies regarding how public transport is considered to show a central problem inherent to the user: the representation of its instrumentation for sustainable local development. It is known that the construction of a collective transport system arises from a female ethic of caring for the environment. In contrast, masculinity considers the system and the environment instrumental for an end to comfort, but the meta-analysis emphasizes that such distinctions are exacerbated in a cultural-political system.

This is the case of postmaterialism that studies of public transport highlight as an explanation of the relationship between intensive use and destination planning. To the extent that users consider that the transport is a cost-effective instrument, they will plan their arrival at central, tourist, recreational, or comfort-free places without considering the crowds, accidents, or insecurity that the saturation of a transport system entails. determined hours [18]. On the contrary, from public policies that consider public transport as a cultural heritage that should be conserved for future generations, the ethics of female care seems to emerge as a hallmark of the choice of destinations and the prevention of risks.

From a cultural policy, public transport is an instrument of entry and exit of the workforce with a predetermined destination of production, service, and consumption [19]. It is a classic perception that a semi-rural periphery must be developed in an urban environment where services proliferate, and transport is distinguished by its efficiency of transfer to work and education nodes. The ethic of care is more distinctive of this policy since it seeks the prevention of accidents and diseases that reduce the productivity of the workforce or strengthen the health system for the care due to diseases.

The polyculture and multicultural initiatives that influence public transport seek to endow it with a positive experience; recreational and satisfactory for the comfort of the user who visits shopping centers or recreational nodes, appreciating the diversity of entertainment or recreation, as well as the assurance that their integrity will always be protected [20]. The ethics of care translates into the preservation of public spaces, central locations, and public squares to promote concord and pacification as a reward for the transfer of an unsafe scenario to a guarded site, but with freedom of expression and action. The transportation system is also an instrument for the inclusion of minorities that manifest themselves in public places and interact with other migratory, tourist, and native flows.

The provisions for the use of public transportation that distinguish acultural, poly, and multicultural policies contrast with intercultural and transcultural initiatives to regulate the activities of natives based on the rights of migrants or the work of minorities according to the requirements of natives [21]. The ethic of care is exacerbated by the availability of public transport and its nodes that are no longer distinguished by their origin or destination.

The hypothesis regarding social post-materialism in which high incomes correspond to the use of sustainable rather than conventional transport seems to show that the habitus around the use of public transport is oriented by materialistic and therefore anthropocentric views rather than by habitus. ecocentric and postmaterialist [22]. The use, cost, and impact of public transport in the university environment imply Perceptions related to gender knowledge and perspectives that establish significant differences among users [23]. Therefore, the conventional public service compared to the so-called sustainable system, when considered asymmetric, explains the transition from environmental knowledge to environmental rationality.

However, a preponderant factor in the transition toward sustainability is post-materialism [24]. The hypothesis of differences between economic income does not support the difference between perceptions regarding the use of sustainable transport to the disuse of conventional and polluting transport. In this way, the sustainability of public transport should be explained from the effect that transport policies have on user groups.

Studies of public transport will move towards lines related to metropolitan governance to generate programs and strategies for management or administration from the acultural, poly, multi, inter, and transcultural approaches [25]. The corresponding public policies will not only prevent the differences between political and social actors, public and private sectors, but will also generate transport systems according to the needs of the users, not because of the image of transport or the representation of their destination, but rather the emergence of environmental care proposals. This is the case of the helplessness or despair that distinguishes the urban centrality from the urban periphery. It is an unfavorable disposition to the collective use and the subsidy concerning the investment in the sector until achieving its sustainability and contributing to the conservation of the city.

Method

A documentary study was carried out with a selection of sources indexed to the main repositories of Latin America: Dialnet, Copernicus, Ebsco, Frontiers, Latindex, Publindex, Redalyc, Scielo, Scopus, WoS, Zenodo and Zotero considering the publication period from 2019. until 2023, as well as the keywords: "governance", "management", "self-management", "quality", "security", "administration", "mobility" and "transport" for the case of cities with risks documented in their public transport system and effects on users.

The information was codified, following the model of decomposition:

- Literature type A for cases of exposure of users to risk events (floods, landslides, fires, coalitions, earthquakes) and exacerbation of the same by corruption (negligence, opacity, nepotism, extortion) with health effects (stress, helplessness, hyperopia, distrust).
- Type B literature for cases of non-exposure to risk events and corruption, but with effects on health.
- Literature type C for cases of exposure to risk and corruption events, but without effects on health.
- Type D literature for cases of non-exposure to risk events and corruption, but without effects on health.

The meta-analysis technique is enough in terms of the parameters you can use to conclude. In the present work, considering that the problem alludes to the possible effects or not of risks public transport on the health of the users, the meta-analysis is understood as an instrument for the diagnosis of possible consequences for the use of public transport in users who may or may not be exposed to floods, fires, environmental contingencies, pollution, insecurity, violence, and crime, associated with stress, exhaustion, depersonalization or frustration.

The information was processed in the statistical package for social sciences (SPSS version 23.0). The proportions of probability (OR) were estimated with a level of significance of 95%

The OR parameter (odds ratio) is used in health sciences to communicate the results of research, referring to a coefficient between two occurrence probabilities of an event to anticipate a relative risk (RR), although in retrospective designs the OR parameter is more used.

The RR estimates suppose confusion biases since they endorse the effect of different risks allusive to the observed events, being the estimation of adjusted OR more feasible since the weighting of adjusted RR cannot be carried out with the most commonly used technique as logistic regression, only binomial logarithmic models reduce confounding bias by providing RR and OR adjustment.

In this way, the formula to explain prospective and retrospective events is:

Prospective: $OR = (a / b) (c / d)$; being a = exposed, b = intervened, c = not exposed, and d = not intervened.

Retrospective or unpaired cases and controls: $OR = (a / c) (b / d)$ where a and c are the subjects' exposure to an event of interest, as well as c and d or exposure of the subjects without the event of interest. In both studies, as well as in cross-sectional studies, the confidence interval that suggests the degree of OR variability is fundamental.

Then, the information was processed in a matrix of content analysis to extract the **main** concepts of the security agenda in public transport and to establish hypotheses concerning the

trajectories of the relationships between the selected concepts. Finally, the scope and limits of the model proposed in the framework of co-government between authorities and users were discussed.

From the literature of findings that relate or not the possible effects of risks in public transport concerning the health of users with no sequelae, expert judges in the thematic areas rated the results in a Delphi questionnaire in three rounds of feedback from opinions.

The information was coded from the Delphi technique, which suggests the qualification of experts considering: 0 for literature that reports no exposure and no user involvement; 1 for the literature that reports the exhibition, but not effect; 2 for literature that warns of exposure and affectation; 3 for the report of exposure and affectation.

Once the first qualification round was made, the results were returned to the judges who adjusted their qualification criteria or maintained their position. In a third final round, the lower and higher scores of judges who maintained their position or modified it were eliminated, but they deviated from the consensus.

Results

The proportions of probability of occurrence of risk events and their possible effects on the health of users. The associations between the types of policies and the types of literature allowed us to carry out models to investigate their structural composition. Once the probabilities of relative risk were established around the risk events and their effects on the local health of public transport users, we proceeded to estimate their structure of relationship trajectories, considering the possible combinations between the types of policies and the types of literature (see Figure 1).

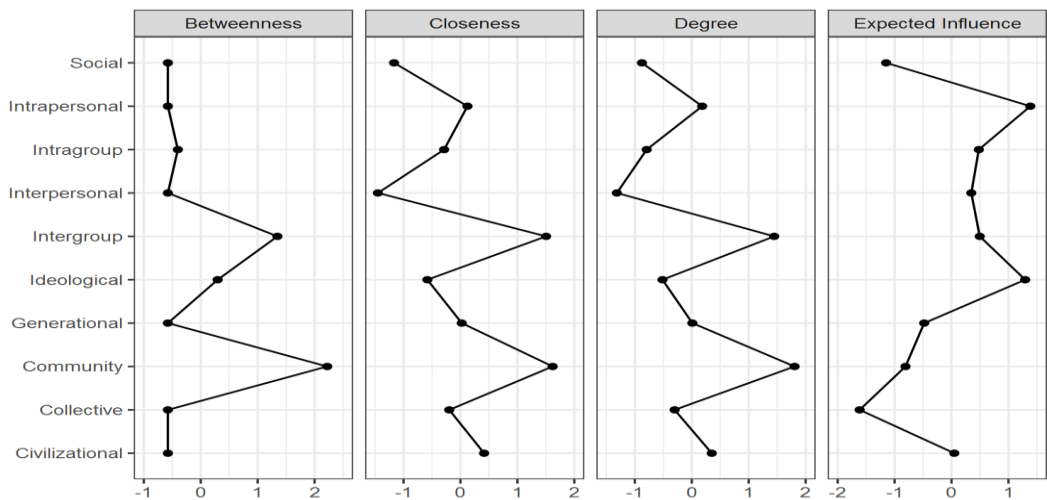


Fig. 1: Centrality of Transport in the Literature from 2020 to 2023.

It is possible to appreciate that the trajectories of reflective relationships between the types of policies and the types of literature suggest a moderate relative risk. That is, the literature seems to record different exposures or not to risk events with different effects or not to the health of the users, highlighting the allusive to non-exposure and non-impact that in the acultural policies are established as a metropolitan agenda (see Figure 2).

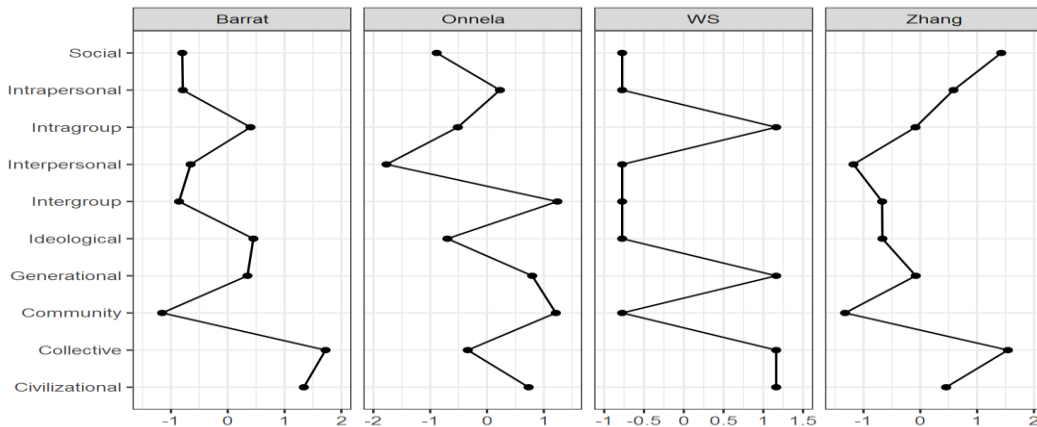


Fig. 2: Clustering of Transport in the Literature from 2020 to 2023.

To observe the emergence of a common policy to the acultural, poly, multi, inter, and transcultural policies, the estimation of a confirmatory structure was carried out. It is possible to observe the emergence of a health policy configured from the acultural, poly, multi, inter, and transcultural perspectives, suggesting a dependency relationship between these elements that would explain the composition of the health policy in terms of attention to the effects of risk events in public transport and its effect on users' health during the period from 2020 to 2023 (see Figure 3).

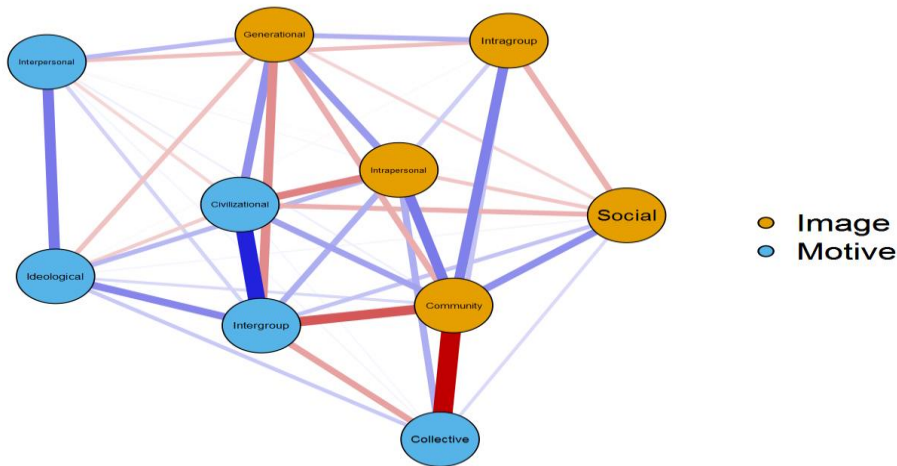


Fig. 3: Network of Transport in the Literature from 2020 to 2023.

The relations between the types of policies and the types of literature allowed us to carry out an analysis of the relations of dependence between the elements. The structure of dependency relations between the types of policies and the types of the literature shows that the acultural policies, indicated by literature that reports the exposure or not of users of public transport in risk events and that had effects on their health or not, influenced local health policies, indicated by the four types of exposure and sequelae enunciated.

To observe the probability ratio structure, the ranges and probability of occurrence were established. It is possible to see that there is a greater proportion of the probability that the

principles of the cultural policy affect the local health policy. Next, the foundations of poly and multicultural politics would be influencing more than intercultural and transcultural presuppositions, suggesting that public transport is an instrument of management and risk management related to the effects of health events.

Discussion

The contribution of the present work to the state of the question lies in a meta-analysis of the contributions to the incidence of risk events associated with corruption on environmental public health, although the design of the research limits the findings to the local scenario, suggesting the extension of work to other metropolises in Latin America.

The technique of data meta-analysis allows glimpses of public transport as a contingent phenomenon that aggravates the risks and could reduce them whenever the metropolitan policies recognize exposure and with or without sequelae, as well as non-exposure and its minor effects or maximums in the health of the users.

Conclusion

This paper aimed to carry out a meta-analysis of public transport studies to compare metropolitan policies in the face of risk events and their effects on users. The review highlights the emergence of acultural, poly, multi, inter, and transcultural systems to the extent that public transport was designed as an instrument of rural development management in the city.

However, risk events have highlighted their effects on environmental public health, the emergence of an environmental care ethic and have highlighted a collective response of users known as post-materialism to explain the intensive use of transport no longer only for its image and destiny, but for the idea of considering that the economic welfare generates more needs of transfer and shelter.

The consequences of the impact of risk events and public policies on the health of users are not explicitly recognized in the acultural, multicultural, and multicultural approach, but it is in the intercultural and transcultural approach where the symbolization of these sequelae in diseases prevails, accidents, or contingencies.

Lines of research related to metropolitan public transport policies and their relation to risk events will allow us to anticipate contingent and differentiating scenarios between political and social actors, as well as between the public and private sectors.

The meta-analytical technique has allowed us to differentiate the literature that deals with public policies, exposure risk events, and probable sequels in users, but an analysis of the trajectories of relationships between these variables will allow us to observe the efficiency of the programs and the effectiveness of the strategies to reduce risks, prevent accidents and address the illnesses derived from the transfer of users from the urban periphery to the central city.

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