

## REVIEW OF TRANSPORTATION RISKS IN THE COVID-19 ERA

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**Abstract:** Objective: This study carried out a systematic literature review to analyze metropolitan mobility policies and peri-urban health, focusing on the effects of public transport safety on users' health.

**Methodology:** A documentary, retrospective, and meta-analytic study was conducted with a non-probabilistic selection of indexed sources published between 2019 and 2021.

**Results:** The findings indicate a predominance of studies supporting non-exposure to risk events derived from mobility policies and their implications for public transport safety and user health.

**Discussion:** Policy comparisons reveal preventive approaches to mitigating risk events and their effects on users' health.

**Conclusion:** Mobility policies focused on transport safety effects do not sufficiently recognize exposure risks or their short-, medium-, and long-term consequences.

**Keywords:** Mobility, public transport, safety, meta-analysis, governance

### REVISIÓN DE LOS RIESGOS DEL TRANSPORTE EN LA ERA DEL COVID-19

**Resumen:** Objetivo: Realizar una revisión sistemática de la literatura sobre políticas de movilidad metropolitana y salud periurbana, enfocada en los efectos de la seguridad del transporte público en la salud de los usuarios.

**Metodología:** Estudio documental, retrospectivo y meta-analítico con selección no probabilística de fuentes indexadas publicadas entre 2019 y 2021.

**Resultados:** Predominan evidencias que sustentan la no exposición a eventos de riesgo derivados de políticas de movilidad y su impacto en la seguridad del transporte y la salud.

**Discusión:** Las comparaciones de políticas muestran enfoques preventivos frente a los efectos de eventos de riesgo.

**Conclusión:** Las políticas de movilidad no reconocen suficientemente los riesgos de exposición ni sus consecuencias en distintos horizontes temporales.

**Palabras clave:** Movilidad, transporte público, seguridad, metaanálisis, gobernanza

### REVISÃO DOS RISCOS DO TRANSPORTE NA ERA DA COVID-19

**Resumo:** Objetivo: Realizar uma revisão sistemática da literatura para analisar as políticas de mobilidade metropolitana e a saúde periurbana, com foco nos efeitos da segurança do transporte público na saúde dos usuários.

**Metodologia:** Estudo documental, retrospectivo e meta-analítico, com seleção não probabilística de fontes indexadas publicadas entre 2019 e 2021.

**Resultados:** Observa-se a predominância de estudos que sustentam a não exposição a eventos de risco derivados das políticas de mobilidade e seus efeitos na segurança do transporte público e na saúde dos usuários.

**Discussão:** As comparações entre políticas revelam abordagens preventivas frente aos efeitos dos eventos de risco na saúde dos usuários.

**Conclusão:** As políticas de mobilidade, centradas na segurança do transporte, não reconhecem suficientemente os riscos de exposição nem suas consequências a curto, médio e longo prazo.

**Palavras-chave:** Mobilidade, transporte público, segurança, meta-análise, governança

## 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 (CARREÓN and GARCÍA, 2015a: p. 2028).

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 (CARREON, CRUZ & SANTOS. 2015: p. 31).

However, robberies, kidnappings, accidents and aggressions against users have generated a 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 lynching's are gestated (GARCÍA, CARREÓN, MECALCO, HERNÁNDEZ, BAUTISTA and MENDEZ, 2014: p. 15).

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 (GARCÍA, JUÁREZ & BUSTOS, 2017: p. 459). This is an imbalance that translates into the state of Mexico and Mexico City (HERNÁNDEZ, CARREÓN, MORALES, AGUILAR and GARCÍA, 2014: p. 5). 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 (GARCÍA, SANDOVAL & AGUILAR, 2016: p. 153). In 2012, 2441 complaints were lodged, but in 2018 only 1564 were processed (GARCÍA, VÁZQUEZ, NÁJERA, LIMÓN & BUSTOS, 2018: p. 37).

In Metropolitan Zone of the Valle México (ZMVM) about 45% of the vehicle fleet shuttle is the public transport private car followed with 29% and taxi use 11%. Inflation (4% accumulated during 2013) of gasoline has increased by 40%, premium by 30%, diesel by 48%, while salary only increased by 28% (INEGI, 2015).

Mexico City occupies the last places 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 (OECD, 2015).

About the family economy, transportation expenses are divided into 50% for buses or minibuses, 30% for urban buses, 16% for radio taxis and 2% for metro (INEGI, 2010). In this context, it is possible to notice that the sustainability of public transport implies the establishment of a collection system according to peri-urban mobility capacities (GARCÍA, CARREÓN, HERNÁNDEZ & RIVERA, 2015: p. 79).

In 2012 there were around 580 robberies that by 2015 had increased to 600 thousand assaults in public, private and concessioned transport (HERNÁNDEZ, CARREÓN, MORALES, AGUILAR & GARCÍA, 2014: p. 20). In the cases by demarcation, 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 (INEGI, 2015).

However, public transportation of 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 (GARCÍA, GARCÍA, ROSAS, CASTILLO, CARREÓN, HERNÁNDEZ & RIVERA, 2015: p. 181). In 2011, 78% of respondents said they felt unsafe in public transport and by 2015 they increased to 80% of respondents. In 2012, the minibús 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 minibús, 340 in the metro and 241 in taxis (INEGI, 2015).

These data exemplify the volume of governance or coordination between political and civil actors, public and private sectors around security, even though statistics highlight the reduction of complaints, crimes seem to hide the discourses surrounding the problematic, since the reduction of complaints does not imply a reduction of crimes or a civil trust in the authorities (CARREÓN, GARCÍA, VILCHIS, MARTÍNEZ, SÁNCHEZ & QUINTANA, 2016: p. 65).

The aim of this paper is to conduct a meta-analysis of the literature on safety and insecurity associated with the exposure or non-exposure of public transport users, as well as its impact on their physical and emotional health between 2019 and 2021 (SEN, 2011: p. 20).

From a meta-analytic perspective, it is possible to examine how conditions of safety or insecurity affect users' health, providing evidence to inform mobility policies, public administration, and citizen self-management strategies (SCHUELE, SCHOROEDER & KUEFFER, 2010: p. 301).

Unlike conventional public policy approaches, meta-analytic methods enable the identification of retrospective patterns of exposure and their corresponding effects on transport users (OEHMICHEN, 2003: p. 147).

In this context, the systematic review analyzes the effects of exposure or non-exposure to risk events, including accidents, diseases, corruption, and institutional failures, and their impact on users' mental and physical health (GARCIA, 2015b: p. 24).

The findings reveal moderate relationships between mobility policies and risk exposure. Acultural policies tend to emphasize scenarios of non-exposure, whereas intercultural and transcultural approaches more explicitly recognize the health consequences associated with such risks (GARCIA, 2015b: p. 24).

This is a scenario in which social diagnosis, civil protection and evaluation of such intervention are convenient. In virtue of which, the development of an integrative model of state management and social self-management are indispensable to reach agreements between the parties involved (SCHEURER, 2013: p. 10).

The mediation of public policies and social needs suppose differences between political and social actors (GARCÍA, CARREÓN, HERNÁNDEZ, AGUILAR & ROSAS, 2016: p. 8). This is because the inclusion of citizens in the political sphere and the inclusion of rulers in civil affairs is increasingly necessary (TRINH, 2013: p. 74).

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 (GARCÍA, 2018a: p. 10).

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 (PITKA, SIMEUNOVIC, TANACKOV & SAVCOVIK, 2017: p. 1147).

Despite the fact that 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 with respect to the periphery, as well as deregulation of transport, Discretionary concessions and the deterioration of public transport units affect the health of users and seem to show that there is an ungovernability and the impossibility of governance or management and administration agreed between civil society and the State (GARCÍA, 2018b: p. 71).

### Theory of cultural policies in the management of risks in transportation

Literature consults, focuses its interest on the effects of public policies whose dimensions it places between acultural, multicultural, intercultural and transcultural (BUSTOS, JUÁREZ & GARCÍA, 2019: p. 39).

The reviewed publications suggest that the acultural, multicultural and intercultural 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 (VALDÉS, AMEMIYA, GARCÍA, 2019: p. 281).

The acultural policy is distinguished from the multicultural and intercultural in privileging to the native communities that inhabit the cities with respect to the migrant flows that go from the urban periphery to the urban centrality (GARCÍA, CARREÓN & HERNÁNDEZ, 2016: p. 168). 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 (GARCÍA, 2019: p. 27).

The intercultural 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 the urban centrality (GARCÍA, CARREÓN, HERNÁNDEZ, RIVERA, AGUILAR & ROSAS, 2015: p. 112). 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 (OLIVÉ, 2010: p. 45).

Multicultural policies on public transport highlight coexistence and order as central premises between migratory flows and native communities but adjusting the uses and customs of visitors to the laws of urban centrality. 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 (GARCÍA, 2019: p. 27). Or, the demarcation of responsibility before the deregulation of transport in the urban periphery (MEJÍA, QUEZADA & GARCÍA, 2018: p. 80).

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 (ALDANA, GARCÍA, SÁNCHEZ, HERNÁNDEZ, ESPINOZA & SANDOVAL, 2019: p. 5).

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 (OLIVÉ, 2011: p. 207).

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 (HERNÁNDEZ, 2007: p. 429).

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 (MEJÍA, QUEZADA, BLANES, COSS, PÉREZ, QUINTERO, RINCÓN & GARCÍA, 2018: p. 8).

### Studies of cultural policies in the management of risks in transport

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 (see Table 1).

**Table 1** - State of knowledge of public mobility and transport safety

Year	AUTHOR	Policies	Literature	Sequels
2010	SCHUELES, CHOROEDE & KUEFFER	Acultural	D	Synchronization
2011	SEN	Acultural	D	Capabilities
2013	CARREON & GARCIA	Intercultural	B	Risk
2013	CARREON, MORALES & ROSAS	Intercultural	B	Quality
2013	MONTES	Policultural	C	Risk
2013	MORALES, CARREON & AGUILAR	Transcultural	A	Habitus
2013	PEREIRA	Policultural	C	Risk
2013	RODRIIGUEZ	Multicultural	C	Security
2013	ROSAS, CARREÓN & MORALES	Transcultural	A	Habitus
2013	SCHEURER	Acultural	D	Accessibility
2014	CARREON, HERNANDEZ & GARCIA	Multicultural	C	Risk
2014	GARCIA ET AL.,	Intercultural	B	Risk
2014	HERNANDEZ ET AL.,	Transcultural	A	Habitus
2014	HERNANDEZ, BUSTOS & RIVERA	Multicultural	C	Usefulness
2014	MEJIA, HERNANDEZ & LIMON	Transcultural	A	Habitus
2014	RIVERA, MENDEZ & HERNANDEZ	Trasncultural	A	Habitus
2015	GARCÍA ET AL.,	Acultural	D	Agglomeration
2015	CARREON, CRUZ & SANTOS	Acultural	D	Rights
2015	GARCÍA	Acultural	D	Self-Control
2015	GARCÍA	Acultural	D	Crime
2015	GARCÍA	Acultura	D	Self-Control
2015	GARCIA ET AL.,	Multicultural	C	Risk
2015	GARCIA ET AL.,	Transcultural	A	Habitus
2015	GARCÍA ET AL.,	Multicultural	C	Quality
2015	GARCÍA ET AL.,	Policultural	C	Quality
2015	GARCÍA	Acultural	D	Management
2015	GARCÍA ET AL.,	Multicultural	C	Corruption
2016	CARREON ET AL.,	Acultural	D	Risk
2016	GARCÍA ET AL.,	Acultura	D	Quality
2016	GARCÍA, CARREÓN & HERNÁNDEZ	Intercultural	B	Agenda
2016	GARCÍA, CARREÓN & HERNÁNDEZ	Policultural	C	Self-Control
2016	GARCÍA, SANDOVAL & AGUILAR	Multicultural	C	Conflict
2016	MEJIA, CARREON & GARCÍA	Acultural	D	Cognition

2017	GARCÍA	Intercultural	B	Governance
2017	GARCÍA, CARREÓN & HERNÁNDEZ	Intercultural	B	Governance
2017	GARCÍA, JUAREZ & BUSTOS	Intercultural	B	Governance
2017	MENDOZA ET AL.,	Policultural	C	Representations
2017	PITKA ET AL.,	Policultural	C	Propagation
2018	ALDANA, ROSAS & GARCÍA	Intercultural	B	Agenda
2018 <sup>a</sup>	CARREÓN, BLANES & GARCÍA	Acultural	D	Risk
2018 <sup>b</sup>	CARREÓN, BLANES & GARCÍA	Intercultural	B	Networks
2018	GARCÍA	Multicultural	C	CPA
2018	GARCÍA	Policultural	C	Climate
2018	GARCÍA ET AL.,	Transcultural	A	Habitus
2018	MEJÍA ET AL.,	Intercultural	B	Agenda
2018	MEJÍA, QUEZADA & GARCÍA	Policultural	C	Readaptation
2018	RINCÓN, JUÁREZ & GARCÍA	Transcultural	A	Habitus
2018	SÁNCHEZ ET AL.,	Multicultural	C	Immigration
2018	SANDOVAL ET AL.,	Transcultural	A	Habitus
2018	SANDOVAL, GARCÍA & RIVERA	Acultural	D	Sociodemographics
2018	VILLEGAS, ROSAS & GARCÍA	Policultural	C	Quality
2019	MARTÍNEZ, SÁNCHEZ & GARCÍA	Acultural	D	Well-Being

A = No exposure and sequels

B = Exposure and Sequels

C = No exposure without sequels

D = Exposure without Sequels

Source: Elaborate with data study

Additional property are differences between users over conventional transport with reference to public transportation called sustainable. 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, with regard to 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 econcentric knowledge and its impact on the perceptual differences between men and women complement the above findings.

The differences that stand out in the studies regarding how public transport is considered show a central problem inherent to the user: the representation of its instrumentation for a 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 an acultural political system.

This is the case of postmaterialism that studies of public transport highlight as an explanation to 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.

On the contrary, from public policies that consider public transport as a cultural heritage which 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 (see Table 2).

Table 2 - Metropolitan public transport policy systems

		Ethics of care		Instrumentation principle	
	Symbolism	Recreation	Comfort	Satisfaction	intensive use
Acultural					√
Policultural		√	√	√	
Multicultural		√	√	√	
Intercultural	√				
Transcultural	√				

Source: Elaborated wit data study

From an acultural policy, public transport is an instrument of entry and exit of workforce with a predetermined destination of production, service and consumption. It is a classic perception that 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 policultural 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. The ethics of care translates into the preservation of public spaces, central locations and public squares with the aim of promoting 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 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 native. 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 postmaterialism 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.

The use, cost and impact of public transport in the university environment implies:

Perceptions related to gender knowledge and perspectives that establish significant differences among users. 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 towards sustainability is postmaterialism. The hypothesis of differences between economic income does not support the difference between perceptions regarding the use of sustainable transport in relation 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 in order to generate programs and strategies for management or administration from the acultural, poly, multi, inter and transcultural approaches. 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 with respect to the investment in the sector until achieving its sustainability and with it 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 2021, 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 (see Table 3).

**Table 3** - Descriptions of the informative sample published from 2019 to 2021 in international repositories on the effects of public transport risks on the health of users

	Dialnet	Copernicus	Ebsco	Frontiers	Latindex	Publindex	Scielo	Scopus	Zenodo	Zotero
Governance	35	37	38	33	26	21	15	11	14	17
Management	30	30	33	28	20	17	11	10	11	13
Mobility	27	28	29	24	15	14	8	7	10	11
Quality	24	26	23	21	13	10	4	5	9	10
Safety	21	20	19	16	10	8	2	3	6	7
Self-management	18	17	15	12	9	5	1	2	3	5
Stewardship	14	13	12	10	5	3	1	1	2	3
Transport	10	11	9	7	3	1	0	0	1	2

Source: Prepared from the bibliographic data base

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 reach a conclusion. In the present work, considering that the problem alludes to the possible effects or not of risks in the 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 a research, referring to a coefficient between two occurrence probabilities of an event in order to anticipate a relative risk (RR), although in retrospective designs the OR parameter is more used (CERDA, VERA & RADA, 2013: p. 1329).

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 (CHEUNG, 2015: p. 5).

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 b 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 with the purpose of extracting 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 with respect to 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 affect; 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

Table 4. refers to the proportions of probability of occurrence of risk events and their possible effects on the health of users.

**Table 4** - Possible effects of risk events in public transport on the health of users reported in the literature from 2019 to 2021

TP	A	B	C	D
A	IP	0,33 (0,28 0,47)	0,66 (0,41 0,83)	0,58 (0,38 0,41)
B		MP	0,10 (0,07 0,49)	0,53 (0,41 0,75)
C			PP	0,75 (0,40 0,92)
D				AP

AP = Acultural Policies  
 PP = Policultural Policies  
 MP = Multicultural Policies  
 IP = Intercultural Policies  
 TP = Transcultural Policies:  
 A = No exposure and sequels  
 B = Exposure and Sequels  
 C = No exposure without sequels  
 D = Exposure without Sequels

Source: Elaborated with data study

The associations between the types of policies and the types of literature allowed to carry out models to investigate their structural composition (see Table 5).

**Table 5** - Associations between types of policies and types of literature

	AP	PP	MP	IP	TP		A	B	C	D
AP	1,000	0,329	0,362	0,310	0,304	A	1,000	0,320	0,374	0,320
PP		1,000	0,370	0,341	0,310	B		1,000	0,381	0,354
MP			1,000	0,305	0,302	C			1,000	0,315
IP				1,000	0,313	D				1,000
TP					1,000					

AP = Acultural Policies  
 PP = Policultural Policies  
 MP = Multicultural Policies  
 IP = Intercultural Policies  
 TP = Transcultural Policies:  
 A = No exposure and sequels  
 B = Exposure and Sequels  
 C = No exposure without sequels  
 D = Exposure without Sequels

Source: Elaborated with data study

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.

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.

With the purpose of observing 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 2019 to 2021.

The relations between the types of policies and the types of literature allowed to carry out an analysis of relations of dependence between the elements.

The structure of dependency relations between the types of policies and the types of literature show 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.

In order 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

The aim of this paper was to carry out a meta-analysis of public transport studies in order 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 reference to 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 postmaterialism 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 is 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 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 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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