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Research for solutions : two indexes to map and cap gambling

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Presenter Disclosure

I have no potential conflicts of interest for my presentation.

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Context

In 2016, the Québec national Institute of Public Health, in collaboration with the Public Health School of University of Montreal, started a research project focused on the "ecological" aspects of gambling, called *Characterization and representations of physical accessibility to games of chance and money in Quebec:*

This presentation aims at a general introduction to the mapping tool that was created.

It starts from the observation that, to create environments conducive to health and well-being, decision-makers and stakeholders need high-performance technical tools to generate up-to-date portraits of the elements of the built environment and neighborhoods

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Context

- Harmful gambling: shifting the focus from problematic people to ‘gamblogenic’ environments (Livingstone, 2020; Rogers, 2020).
- Very interesting advances have been made in terms of methods for estimating the spatial distribution and effect of gambling environments (Markham, Young & Doran, 2017; Wardle 2017; Dei & al., 2020).
- In Québec, several ecological studies of gambling have shown that the density or access to VLT’s is related to the socioeconomic deprivation of geographic sectors and gambling vulnerability (Gilliland, 2005; Houle et Robitaille, 2013; Robitaille et Herjean, 2008; Biron, Bazargani, Robitaille, 2016;2017).

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Context

Four main observations have emerged from those research on harmful gambling environments:

1) There is a positive relationship between access to gambling sites and the adoption of gambling habits in neighbouring communities (Adams & al., 2007; Marshall, 2005; Productivity Commission, 2010; Philander, 2019);

2) Results demonstrate that spending and/or the severity of gambling problems increase with proximity to gambling venues (although this effect may diminish after a few years) (Adams & al., 2007; Barratt & al., 2014; Delfabbro, 2003; Rush & al., 2007; Scholnick & Byun, 2016; Storer & al., 2009; Welte & al., 2007; Slutske & al., 2015; Slutske & al.,2019);

3) The gambling offer in bars, clubs, etc. tends to be localized to areas that are disadvantaged from a socio-economic perspective (Astbury & Thurstain-Goodwin, 2015; Marshall & Baker, 2002; Marshall & al., 2004; Rintoul & al., 2013; Wardle & al. 2012; Wheeler & al., 2006; Xouridas & al., 2016);

4) Finally, several authors have established a connection between the three dimensions, which are density/proximity of the gambling offer, deprivation and spending or gambling problems (Rintoul & al., 2013; Astbury & Wardle, 2016; Lund,2009; Pearce & al., 2008; Room & al., 1999; Welte & al., 2004; Welte & al., 2016; Young & al., 2012; Wardle & al., 2017; Sulkunen & al., 2018).

Goal of the research

- Propose an innovative method to characterize local gambling environments in Quebec
- Address social inequality with respect to gambling exposure
- Support decision making with an adapted mapping tool

Two index were developed: the gambling exposure index (GEI) and the vulnerability to gambling index (VGI)

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Method: 1 - Gambling exposure index (GEI)

1- Operationalization of a local **gambling exposure index** (GEI), composed of three dimensions:

- spatial accessibility to gambling sites
- density of gambling places
- relative risk associated with each type of games

The two floating catchment area (2SFCA) method was used to combine those dimensions into a single variable (GEI).

The 2SFCA method is executed in two steps: estimation of the gambling site offering (density and risk) and calculation of the accessibility scores

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Method: summary of parameters used to calculate the GEI

Games	No. of sites	Gambling places (S_j)	Type of establishment	Relative risk ($risque_j$)	Variants in accessibility measurements	Coverage area (km) C_j
Lottery	8575	NA	Casinos, gambling parlour, Bingo halls, convenience stores, kiosks, etc.	1	V2SFCA	0.5 to 47
Kéno	3	NA	Casinos	1	2sfca	20 to 200
Bingo	43	16 845	Bingo halls	3.08	2sfca	10
Kinzo	17	1118	Kinzo halls	3.08	2sfca	10
Table games	4	1088	Casinos	4.46	2sfca	20 to 200
Poker (casino)	4	627	Casinos	4.46	2sfca	20 to 200
Electronic Roulette Blackjack	6	201	Casinos, gambling parlours	4.46	2sfca	20 to 200
Slot machines	6	6206	Casinos, gambling parlours	5.15	2sfca	20 to 200
Interactive terminals	4	217	Casinos	5.15	2sfca	20 to 200
Horseracing betting	10	NA	Betting venues,race track	6.54	V2SFCA	1 to 50
Video lottery terminal (VLT)	1 641	10 534	Gambling venues, Bingo, Kinzo halls, bars, etc.	10	V2SFCA	0.5 to 20
Total (Marsh 2018)	10 314					

Method : 2- Vulnerability to gambling index (VGI)

2- Operationalization of a local **vulnerability to gambling index** (VGI) based on 6 socio-economic proxies of problem gambling:

- % Men
- % 20-44 years
- % Lower income
- % High school diploma or lower
- % Unemployed
- % Widowed, single, divorced

The six indicators were weighted according to odds ratios before being summed to produce the VGI

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Method: odds ratio (O.R.) of variables related to problematic gambling from the Canadian Problem Gambling Index (CPGI)*

- Logistic regression of the six indicators
- Measurement of correlation strength by their odds ratio
- The higher the odds ratio, the greater the weight given to the indicator in the overall vulnerability index

Variables	O.R.	Weights for creating the Index
Over 44	Ref.	
18-44 years	1. 214	1
Women	Ref.	
Men	2. 124	2
Person not living alone	Ref.	
Person living alone	1. 325	1.5
Employed person	Ref.	
Unemployed person	1. 071	1
Person with more than a high school diploma	Ref.	
Person with a high school diploma or less	1. 454	1.5
Household income over $60 000		
Household income under $60 000	1. 491	1.5

*Special compilation from 2009-2012 ENHJEU survey data (Kairouz et coll. 2014)

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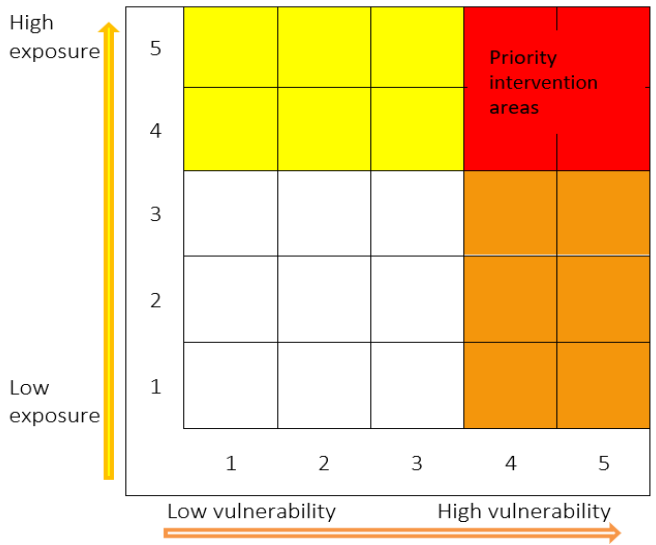
Method: associations and convergence

3- Spatial and statistical analyses were conducted to explore the relationship between VGI and GEI

- To identify the dissemination areas (DA) most at risk on the territory, i.e. those displaying a high convergence of GEI and VGI, we firstly measured the relationships between the vulnerability index components, the VGI, and the GEI across Quebec through a bivariate correlation analysis using Spearman's rank test.
- They were then divided into exposure and vulnerability quintiles



	Priority area: high exposure to gambling and high concentration of population vulnerable to gambling
	Vulnerable area: high concentration of population vulnerable to gambling
	Exposed area: high exposure to gambling

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Results

- There was a significant positive relationship between the GEI and the VGI
- 2,599 of Quebec's 13,420 dissemination areas show high values of vulnerability and exposure to gambling, 1,394,042 people living in these sectors (17% of the Quebec population).
- The analysis and mapping of the two indexes reveals disparities in exposure and vulnerability to gambling in Quebec.
- Results support the aforementioned ecological studies which determined a connection between gambling accessibility and socio-economic deprivation

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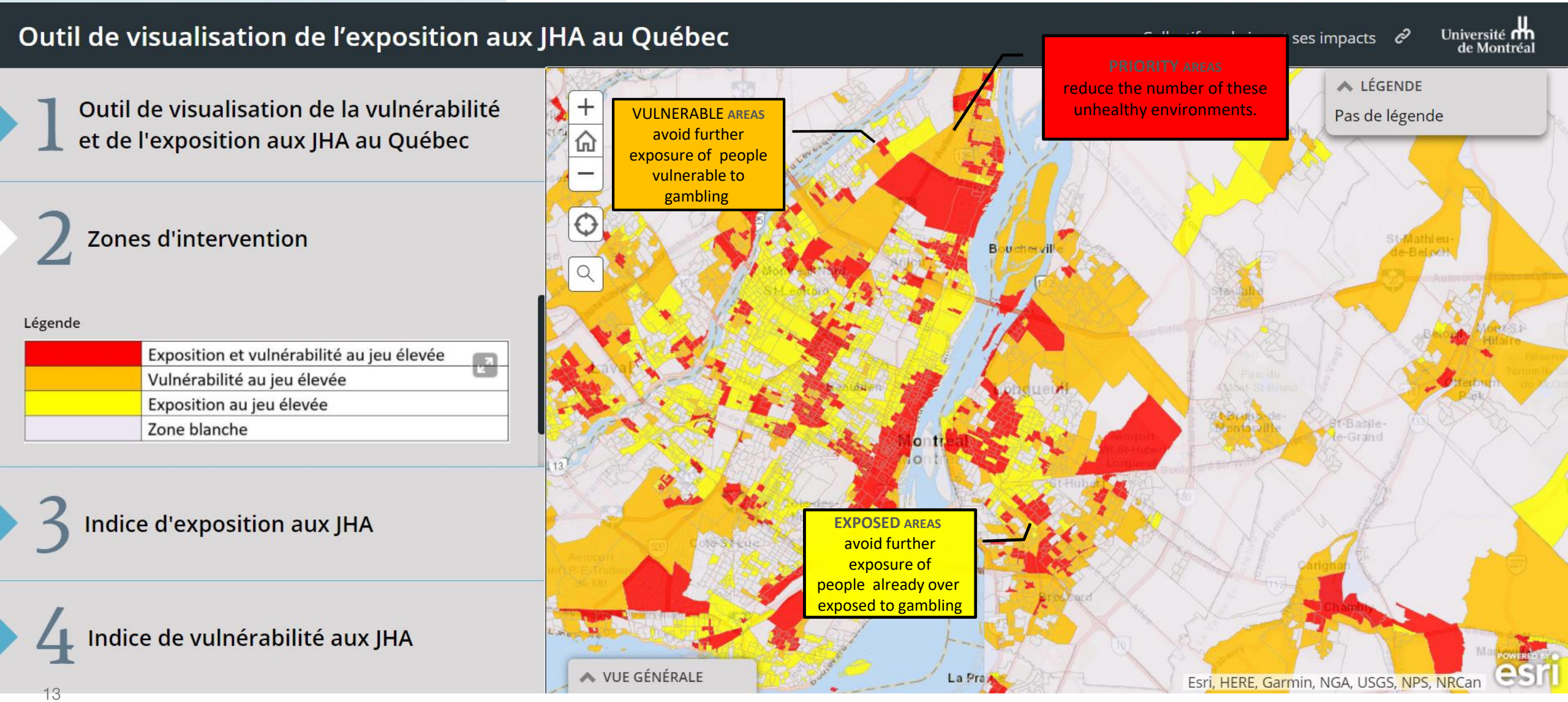
Identification of three types of disseminations areas
Proposal of three types of intervention



Contribution to better living environments

- The online cartographic platform on which these maps are interactively displayed is a promising monitoring and decision-making tool for policy makers and communities:
  - To reduce the presence of gambling in the most vulnerable and exposed sectors
  - To locate and adapt prevention and intervention initiatives to each environment
  - To act globally to reduce health inequalities in neighborhoods: in order to do so, it would also be interesting to geolocate on the same map the facilities in terms of culture, leisure or sports in our "priority“ areas and, as well, to map exposure to alcohol or cannabis outlets, for example.

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Next steps

- Analyze of our qualitative interviews with gamblers to understand how the spatial configuration of games contribute to initiate, facilitate and encourage harmful gambling
- Hold a virtual consultation with stakeholders on data and recommendations to be put forward
- Adapt knowledge transfer to: researchers; governmental, city, community stakeholders; regional public health directors

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Future research

- Survey to quantify how our two environmental index do indeed translate into specific gambling habits and prejudices in a sample *of priority areas*, compared to "white" areas .
- A theoritical reflexion and maybe an ecological measure about "gambling tolerance capacity" could be developed
- Using local data, the VGI and GEI have good potential for adaptation in other jurisdictions

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Limits

- Exposure to gambling is underestimated in some sectors; poker tournaments outside of casinos, gambling in Indigenous areas, and gambling in marginal areas are not included in the GEI
- Annual data updates necessary to reflect reality
- Obtaining complete data on gambling establishments depends on the willingness and transparency from the state-owned companies that operate gambling

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Mot de la fin et questions

The closure of a number of gambling establishments during the pandemic is a favorable context for reflection on new criteria for the location and allocation of licenses for video lottery terminals, lottery outlets and other games.

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