

Leveraging consumer purchase data (CPD) for effective contact tracing: balancing public health benefits and privacy concerns

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Abstract

Introduction

During the Rugby World Cup 2023, a botulism outbreak linked to canned sardines in Bordeaux highlighted the role of consumer purchase data (CPD) in contact tracing. This study examines CPD's use in identifying contacts for rapid public health interventions.

Methods

CPD was utilised to screen meal orders and identify customers who purchased canned pesto via Sumup terminals.

Results

We adopted the practice used by the French authorities, using CPD information to identify 44 Irish transactions. Despite identifying exposed individuals, data linkage issues delayed medical response for Irish consumers. Privacy concerns were addressed, balancing public health benefits.

Discussion

The botulism outbreak case underscores the importance of cooperation with new partners and the potential for CPD in enhancing public health responses. Future research should focus on improving data accuracy, privacy protection, and developing international standards for CPD use in public health.

Introduction

The Rugby World Cup 2023 in Bordeaux, France, was marred by a severe outbreak of type B botulism linked to the consumption of canned sardines. This incident underscored the critical role of consumer purchase data (CPD) in contact tracing, highlighting its potential to facilitate rapid public health interventions. The outbreak involved multiple nationalities, and the French authorities successfully utilised CPD to identify and trace contacts, enabling timely medical responses.¹

Methods

In September 2024, five family members were hospitalised in France with botulism symptoms after ingesting artisanal pesto made with wild garlic sold in small cans in a French market. The product was not exported, but many tourists could have bought it and take them home (i.e. either inside or outside of France). In a similar approach, CPD was utilised in an attempt to screen purchases and identify customers who purchased canned pesto via Sumup terminals. Despite the successful identification of 44 Irish transactions, limitations in data linkage hindered timely identification and public health response for the affected Irish consumers. Linking consumer purchase data (CPD) to personal identifiable information was not possible, as no established frameworks or pathways currently exist to facilitate such integration. Privacy and ethical concerns were actively explored in collaboration with banking authorities. Initial engagement focused on responding to queries from the banking sector regarding data protection, as part of broader efforts to balance public health benefits with individual privacy rights.

Results

The botulism outbreak case highlights the importance of cooperation with new partners and the potential for CPD to enhance public health responses. Future research should focus on improving data accuracy, privacy protection, and developing international standards for CPD use in public health.

CPD contains valuable data about people's movements and behaviours, which can be leveraged for public health purposes, especially in contact tracing for foodborne outbreaks. Several studies have described the benefits of using CPD for timely interventions during outbreak management.^{2,3,4,5}

CPD provides several potential advantages for automating outbreak investigations. If agreements are in place with database providers, CPD can in theory quickly be accessed and used to generate outbreak vehicle hypothesis. Secondly, they may be used to estimate the strength of the association between a potential vehicle and outbreak cases.³ Finally, CPD has been successfully used to identify consumers at risk during foodborne outbreaks.¹ For certain

diseases, like botulism, that early administration of anti-toxin is essential for a favourable outcome, timely access to CPD could potentially save many lives.

During a *Salmonella Enteritidis* outbreak investigation in London CPD was used to define the population at risk that purchased food from the restaurant.⁵ Investigators were able to estimate the number of people at risk through the quantity and combination of food items bought. Their analyses provided epidemiological evidence of an association between the consumption of rotisserie chicken and developing a gastrointestinal illness. CPD was also used to compute the relative risk (RR) during a foodborne outbreak of *Shigella sonnei* linked to a restaurant chain in Ireland. The use of CPD to assess whether there was an elevated risk of illness associated with product A was a simple method which supported the identification of a possible vehicle of infection where traditional analytic methods were not feasible.⁶

The right to the protection of personal data is a fundamental right enshrined in the European Union (EU) Charter of Fundamental Rights.⁷ The directive lists several possible grounds for legitimate processing including “the protection of the vital interests of the data subject” and “the performance of a task carried out in the public interest”.

Regulation 45/2001 concerning the processing of personal data by EU institutions and bodies contains a similar formulation. A commonly applied legal basis to request access to databases containing cash register information is the necessity of the processing for the performance of a task carried out in the public interest based on EU law.

However, privacy concerns should be addressed when using or planning to use personal financial data for Public Health purposes. The Guidelines on data protection in EU financial services regulation provides a 10-point checklist for analysing data protection and privacy (see Table 1).⁸ The questions presented indicate many concerns arising from the use of financial data and are very useful to guide the development of a framework to access such databases safely and to provide reassurance for data subjects.

TABLE 1: 10-point checklist for analysis data protection and privacy

10-point checklist for analysis data protection and privacy

The list of questions, developed for policymakers and legislators in the area of financial services regulation, is a summary of the 10-step methodology which the EDPS commands in the section 3 of these guidelines.

1. Is personal information, and in particular sensitive data, likely to be processed - in other words collected, analysed or used in some way? And if so, what information?
2. Would the processing of personal information interfere with the individual's right to respect for private and family life, home and communications?
3. Is there a clear purpose for processing the personal information? Will the information be processed further for other purposes and, if so, are these compatible with the original purpose?
4. Is there a legal basis for processing the personal data?
5. On the basis of the impact assessment, what is a proportionate maximum period for which personal information will be stored or kept on file?
6. Who in the EU needs access to the data for the stated purposes?
7. Is it necessary to transfer personal information to third countries? What is the legal basis?
8. Are there sufficient guarantees that data subjects can exercise their rights to access and correction, as well as other relevant rights?
9. What technical and organisational security measures are appropriate, especially where large or complex databases and IT systems are envisaged?
10. Can you demonstrate to an independent supervisory authority that the processing of personal data complies with data protection law?

Source: Guidelines on data protection in EU financial services regulation

In Ireland, Public Health authorities comply with the Infectious Diseases Regulations and its subsequent amendments and with the International Health Regulations (IHR).^{9,10} Those regulations aim to prevent, protect against, control and provide a public health response to the spread of infectious diseases nationally and internationally. Such actions include the transfer of personal identifiable information to countries outside of the EU where EU legislation for data protection and privacy is not applicable to them. To overcome potential disruptions in the process of using CPD for public health response, it's essential to establish and maintain agreements between public health institutions and retailers securing data access worldwide.

Balancing the need for detailed data with privacy protections presents several challenges. First, there are no established pathways for accessing CPD, especially for contact tracing. This includes identifying who to contact and what level of information can be made available. Ideally, public health authorities would receive names and phone numbers to implement interventions, but this is complicated by the variety of card terminals used in Ireland and abroad.

Access to CPD is often restricted due to privacy concerns and legal requirements. To address these challenges, a multi-agency response involving public health, food safety authorities, data controllers, card terminal representatives, financial institutions, and national retail boards is essential. Clear agreements must be established, detailing what data is required, the purpose for processing it, the duration of storage, the legal basis for processing, and obtaining consumer consent where possible.

An alternative approach involves financial institutions, card terminal representatives, and retail boards developing a framework to act on public health notifications. This could include alerting consumers at risk without sharing personal identifiable information (PII) directly with public health teams. However, this method relies on consumer engagement, which may be limited. Ideally, Public Health teams would receive consumer information simultaneously with alerts issued to them, allowing timely reassurance and advice (see [Figure 1](#)). This would also enable further identification of resources needed depending on the severity of the disease and potential impact on the health system.

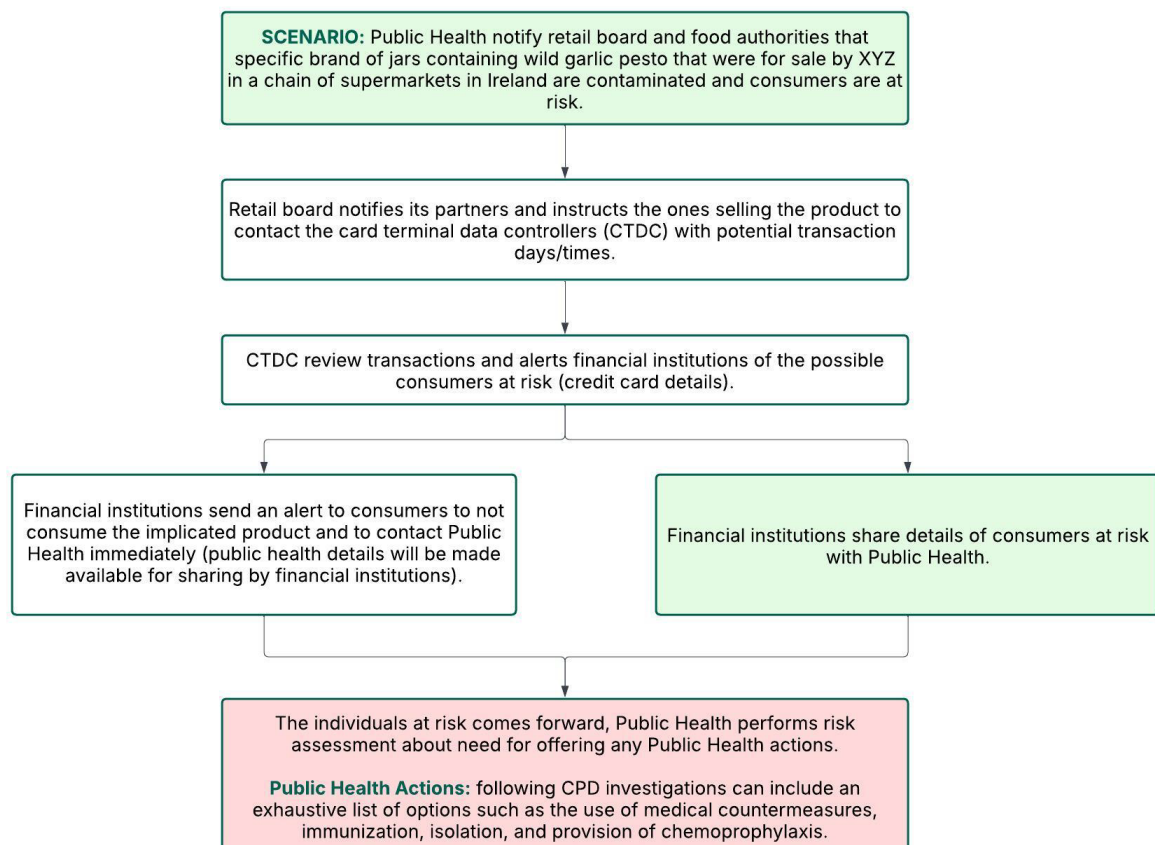


Figure 1: Proposed ideal structure for using CPD to potentially identify individuals at risk using personal identifiable information (PII) with Public Health

The botulism outbreak case underscores the importance of cooperation with new partners and the potential for CPD to enhance public health responses. Future research should focus on improving data accuracy, privacy protection, and developing international standards for CPD use in public health. Establishing a formal framework in Ireland to link CPD with banking systems effectively is crucial. This framework should balance public health benefits with privacy protections, ensuring timely and effective responses to foodborne outbreaks and other public health emergencies. Furthermore, public expectation increasingly demands that modern information technology (IT) processes be employed to facilitate public safety. Incorporating advanced digital tools not only enhances the timeliness and accuracy of public health responses but also aligns with societal demands for proactive and transparent health protection measures.

Declarations of Conflict of Interest:

None declared.

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