

## **Executive Summary**

**Temporal Trends of Online Search for HIV and AIDS-Related Information and its Association with HIV Risk Perception and Protective Behavior Among Men who have Sex with Men in Hong Kong, from 2004-2014, an Infodemiological Study (MSS236R)**

### **Objectives**

The aim of this project was to examine the temporal trends and search patterns for online HIV and AIDS-related information among the MSM population and also the general population, and to explore their association with HIV-related events, relevant media reports, HIV protective behaviour and HIV risk perception in Hong Kong.

### **Design**

Retrospective observational infodemiological study

### **Setting**

Internet-based setting.

### **Participants**

MSM and the general population.

### **Methods**

Google Trends was used as a major data collection tool. A two-stage snowballing technique was used to identify a final keywords list.

WiseNews database was used to search for related news. Related keywords were used for the initial retrieval of news articles, further screened for relevance by stated inclusion and exclusion criteria.

We conducted time-series decomposition analyses on Google Trends and WiseNews to explore if there are correlations or causality between these trends. We applied the Anderson-Darling normality test to test for the normality of Google Trends. We applied Augmented Dickey Fuller test to test for their stationarity, and Granger Causality test to test if WiseNews was useful in forecasting Google Trends. Trends that are significant at 10% level are further explored using the Orthogonal Impulse Function.

We constructed a “HIV” to “AIDS” Google Trends search ratio as a proxy indicator for HIV risk perception. Cross-wavelet analyses were then conducted.

### **Main outcome measures**

- 1) Association between HIV, AIDS and MSM-related online search trends and related news coverage trends.
- 2) Cross-wavelet analyses of Google Trends in Hong Kong, HIV versus HIV/AIDS ratio.

### **Results**

We resulted into a set of 69 Google search keywords and 5245 relevant WiseNews articles. We showed that WiseNews trends of Editorial Pages impacted positively on both “HIV” and “AIDS” Google Trends. MSM-related WiseNews trends also showed predominantly positive impacts on “MSM” Google Trends. Cross wavelet analyses of HIV and “HIV/AIDS” ratio also displayed periodicity of 3 to 8 months.

### **Conclusions**

We showed that HIV/AIDS news drive online search behavior on the same topic. Our results had important implications in designing online HIV/AIDS promotion and awareness campaigns.

# 本港網上搜尋愛滋病相關資訊的趨勢與男男性接觸者風險認知和保護行為的關係的信息學研究 (2004-2014) (MSS236R)

## 目標

研究網上愛滋病相關資訊的趨勢，探討與事件的相關性、相關報導、保護行為和感染的風險。

## 設計

回顧觀察性研究

## 設置

互聯網

## 參與者

男男性接觸者、一般人口

## 方法

Google 趨勢數據，從基本字詞用兩階段雪球技術來確定相關關鍵字表。

使用新聞數據庫用相關字詞初步檢索新聞，通過標準檢視相關性，進一步編碼，建立新聞趨勢。對 Google Trends 和新聞進行了時間序列分解分析，以探討這些趨勢之間是否存在因果關係。應用 Anderson-Darling Test 來測試 Google 趨勢的正常性。應用 Augmented Dickey Fuller Test 來測試他們的穩定性，以 Granger Causality Test 來測試新聞是否有助於預測 Google Trends，使用 Orthogonal impulse function 進一步探索在 10% 上顯著的趨勢。

構建愛滋病毒與愛滋病毒/愛滋病 Google 趨勢比率作為愛滋病毒風險感知指標，進行交叉小波分析。

## 主要指標

- 1) 網上搜索與新聞趨勢之間的關聯。
- 2) 愛滋病毒與愛滋病毒/愛滋病 Google 趨勢的比例。

## 結果

共產生了 69 個關鍵字及 5245 個相關新聞。新聞趨勢對“愛滋病毒”和“愛滋病”Google 趨勢都有正面的影響。男男性接觸者的新聞也顯示出對其 Google 趨勢的正面影響。交叉小波分析顯示 3 至 8 個月的週期。

## 結論

愛滋病新聞推動了相關的網上搜尋，對網上宣傳和推廣有重要意義。