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Using Medications Sales from Retail Pharmacies for Syndromic Surveillance in Rural China

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Objective

To use an unconventional data - pharmaceutical sales surveillance for the early detection of respiratory and gastrointestinal epidemics in rural China.

Introduction

Drug sales data as an early indicator in syndromic surveillance has attracted particular interest in recent years (1, 2), however previous studies were mostly conducted in developed countries or areas. In China, many people (around 60%) choose self-medication as their first option when they encounter a health problem (3), and electronic sales information system is gradually used by retail pharmacies, which makes drug sales data become a promising data source for syndromic surveillance in China.

Methods

This experimental study was conducted in four rural counties in central China. From Apr. 1st 2012, there are 56 retail pharmacies joined the study, including 21 county pharmacies and 35 township pharmacies. 123 drugs were selected under surveillance based on the analysis of local historical sales volume and consultation with local pharmacists, including 19 antibiotics, 15 antidiarrheal medications, 9 antipyretics, 41 compound cold medicine, and 39 cough suppressants. Daily sales volume of the selected drugs was recorded into the database by pharmacy staff at each participating unit via electronic file importing or manual entering. Figure 1 showed the user interface for data viewing, query and export. Field training and supervision were regularly conducted to ensure the data quality.

Results

From Apr. 1st to Jun. 30th 2012, there were 103814 sales records reported in the system, including 44464 (42.83%) records from county pharmacies and 59350 (57.17%) from township pharmacies. Among all surveillance drugs, the sales of compound cold medicine accounted for the largest proportion (43.42%), followed by antibiotics (22.52 %), cough suppressants (18.50%), antidiarrheal drugs (9.49%) and antipyretics (6.06 %). More than 80% data were reported into the system within 24 hours after the sales date, and the reporting timeliness of county pharmacies improved with time (table 1). Missing report rate was less than 5% for all surveillance units. Several reporting mistakes were found during the first three-month implementation, which might be due to system bugs, data provider unfamiliar with the system especially when manual reporting, data providers' carelessness, and some pharmacies reluctant to share sales data amongst others.

Conclusions

Although the current reporting timeliness and completeness are satisfying, it is noteworthy the quality of data is not stable during the beginning phase of the implementation. Further validation of the data will be required. To ensure the accuracy of data and the effective and sustainable deployment of the system, it is imperative to establish a data sharing policy between pharmacies and public health agencies, and achieve automated data collection to avoid additional human labor involvement.

Table 1: Timeliness of reporting records from various pharmacies, Apr. 1st - Jun. 30th, 2012

Report time after sales date	April		May		June	
	County N(%)	Township N(%)	County N(%)	Township N(%)	County N(%)	Township N(%)
within 24 h	11359(75.84)	16653(85.6)	12483(81.80)	17749(87.99)	12225(85.93)	15977(81.01)
24 h-48h	1523(10.25)	1001(5.15)	1487(9.74)	1760(8.72)	1321(9.29)	2224(11.28)
later than 48h	2084(13.91)	1801(9.26)	1290(8.45)	663(3.29)	680(4.78)	1522(7.72)
Sum	14978	19455	15260	20172	14226	19723

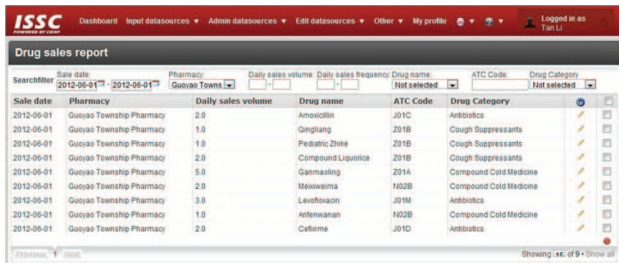

Figure 1 User interface in the system for data viewing, query and export

Keywords

Syndromic surveillance; Medication sales; Developing settings

Acknowledgments

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