

PharmaLeaks

Understanding the Business of Online Pharmaceutical Affiliate Programs

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UCSD CSE
Computer Science and Engineering



Krebs on Security
In-depth security news and investigation



Your cart: **\$0.00** (0 items)[Proceed to Checkout](#)Canadian  Pharmacy

#1 Internet Online Drugstore



- Special offer
- Free Viagra Samples
- 4 pills for every order
- 12 pills for order > 300 USD

Product list

VIAGRA

For Order more than \$300:
12 VIAGRA PILLS

FREE

For other Orders:
4 VIAGRA PILLS



★ Bestsellers

- [Viagra](#)
- [Cialis](#)
- [Viagra Professional](#)
- [Cialis Professional](#)
- [Viagra Super Active+](#)
- [Cialis Super Active+](#)
- [Levitra](#)
- [Viagra Soft Tabs](#)
- [Cialis Soft Tabs](#)
- [Levitra Professional](#)
- [Female Viagra](#)
- [Propecia](#)
- [Xenical](#)
- [Viagra + Cialis + Levitra](#)
- [Brand Levitra](#)
- [Female Cialis](#)
- [Doxycycline](#)
- [Phenteramine](#)
- [Potassium Iodide](#)
- [Brand Viagra](#)
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Bestsellers



Viagra

Our price: **\$0.99**


Viagra is an oral medicine used for treating male impotence (e.g., erectile dysfunction). Viagra's advantages are a great safety track record and proven side effects. The effect of Viagra starts in 30 minutes to 1 hour and lasts for about 4 hours.

[More info](#) Add to cart

Cialis

Our price: **\$0.58**

Cialis (Tadalafil) is an oral drug, used for treating male impotence, also known as erectile men's erectile dysfunction. Cialis' effect starts working in 30 minutes and lasts for about 48 hours, while Viagra effect lasts for about 4 hours. Cialis is...

[More info](#) Add to cart

Viagra Professional

Our price: **\$1.88**

Viagra Professional is a new generation extra-strength prescription medicine that is taken orally for the treatment of erectile dysfunction only in men, powerfully activating the natural blood flow, followed by hardness and expansion of your sexually...

[More info](#) Add to cart

Viagra + Cialis

\$83.99

10 x Viagra
100 mg
10 x Cialis
20 mg

[ORDER NOW](#)

May we suggest



Viagra

Our price: **\$0.99**[More info](#)

Cialis

Our price: **\$0.58**[More info](#)

Levitra

Our price: **\$2.82**[More info](#)

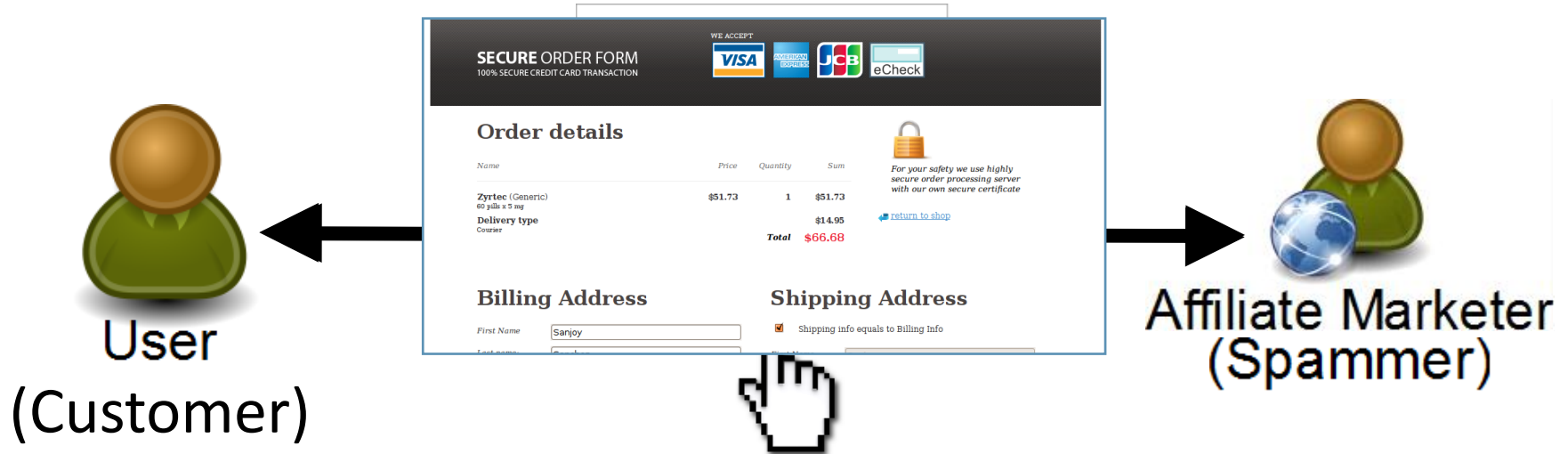
Viagra Soft Tabs

Our price: **\$1.97**[More info](#)

Viagra Professional

Our price: **\$4.88**

Players in the Spam Economy



Pharmaceutical Affiliate Business

- Online pharmaceutical affiliate programs are a major **sponsor of spam** (email and web)
- Important to understand their business model to **identify** fragile **bottle necks**
- **Goal**: Characterize key aspects of pharma affiliate program business

Affiliate Program

- An affiliate program needs to coordinate three main entities to be profitable
 - Affiliates (paid on commission)
 - Suppliers (goods and shipping)
 - Payment processing
- Operates as a business that maintains financial records

PharmaLeaks

- Analysis of a broad corpus of **ground truth data** for pharmaceutical affiliate programs
- **Customers** - Demographics, product selection, reorder rates, market saturation
- **Affiliates** - Dynamics of labor market, commission income
- **Affiliate Programs** - Empirical revenue and cost model

Leaked Data Sets

- Numerous “leaked” sources of financial and operational data for 3 affiliate programs
 - GlavMed/SpamIt back-end database including **order information, transactions** and so on
 - Chat Logs from GlavMed/SpamIt operator
 - Restricted transactional data for Rx-Promotion
 - Revenue and cost structure for Rx-Promotion

Summarized Data

- 185M in gross revenue, 1+ million customers, 1.5+ million purchases, 2600+ affiliates
- SpamIt is a fork from GlavMed and both are operated by same people
- RX-Promotion transaction data limited to US customers

Program	Period	Affiliates	Customers	Billed orders	Revenue
GlavMed	Jan 2007 – Apr 2010	1,759	584,199	699,516	\$81M
SpamIt	Jun 2007 – Apr 2010	484	535,365	704,169	\$92M
RX-Promotion	Oct 2009 – Dec 2010	415	59,769 – 69,446	71,294	\$12M

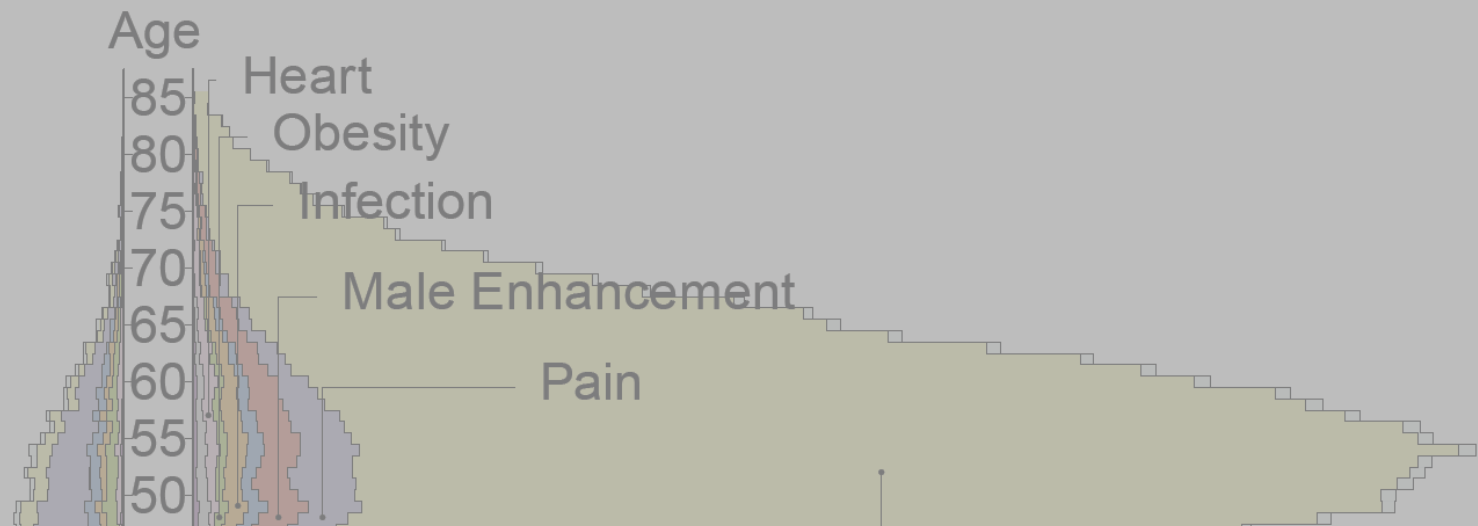
Customer Demographics

Country	Orders	%
United States	1,044,173	74.8%
Great Britain	88,823	6.4%
Canada	53,113	3.8%
Germany	39,353	2.8%
Australia	31,918	2.3%

**95% of costumers from U.S,
Canada, Europe, and Australia**

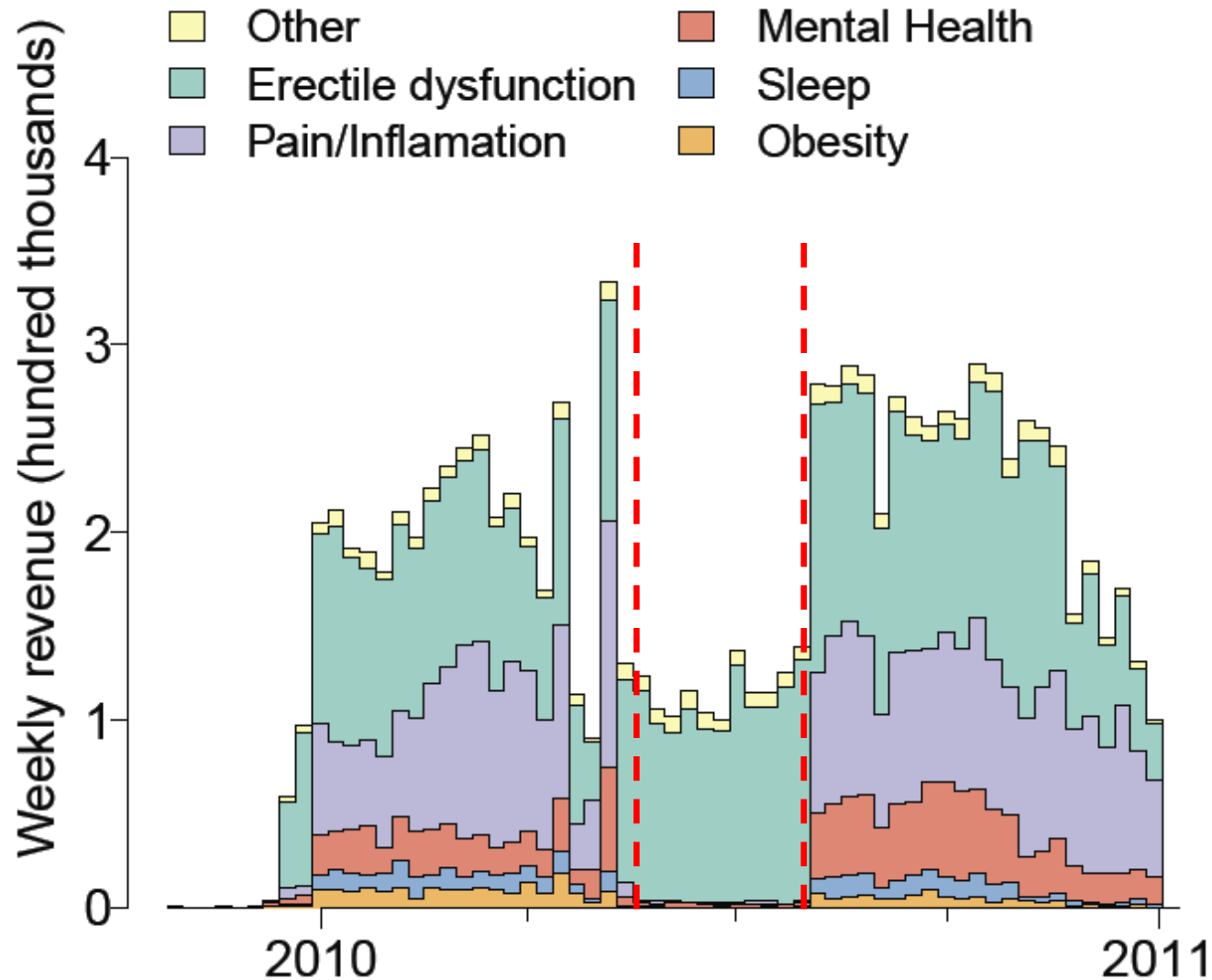
Consistent with [Kanich, Security 2011]

Products

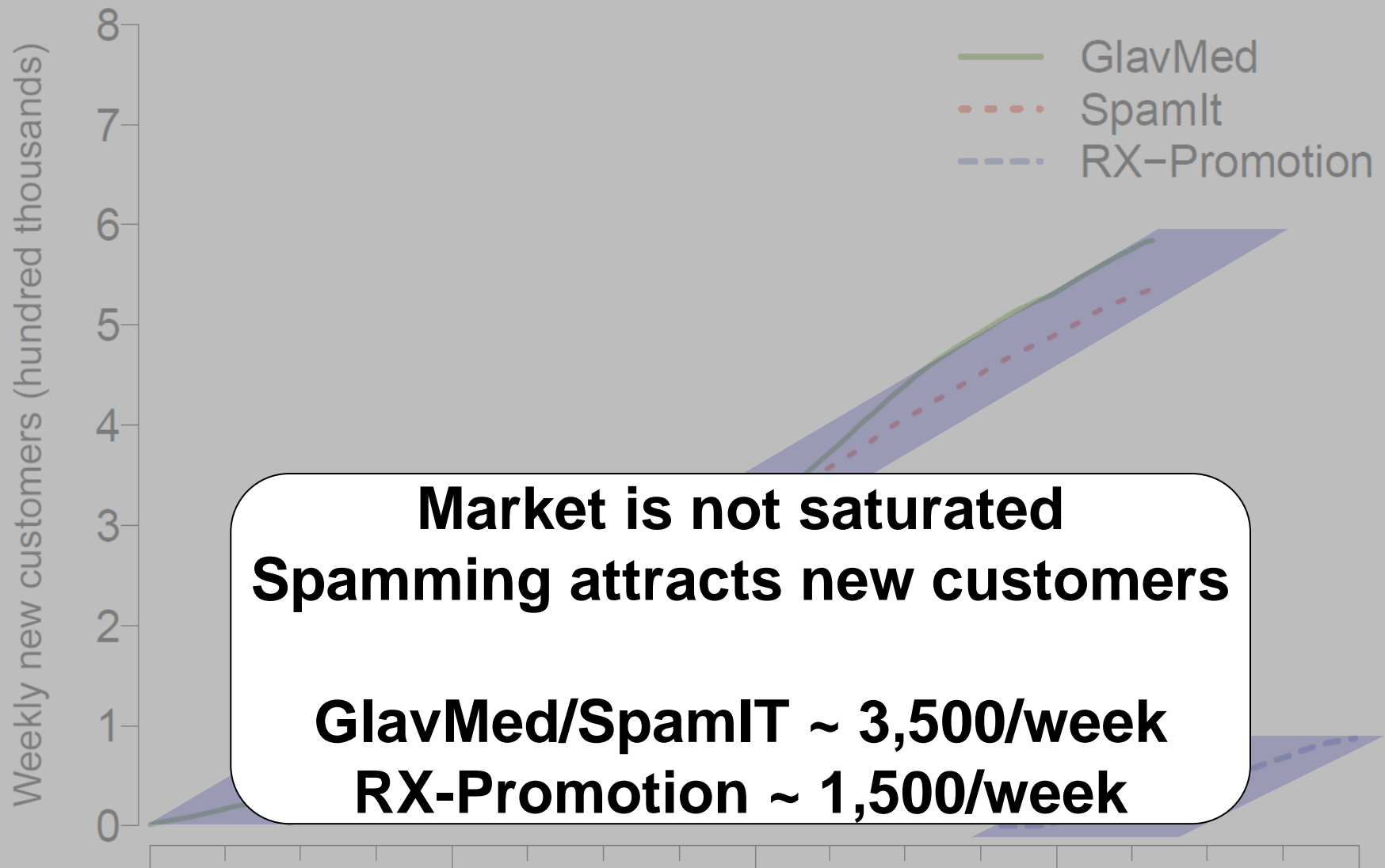


**ED produces make up ~75% of orders and
~80% of revenue for GlavMed/SpamIt**

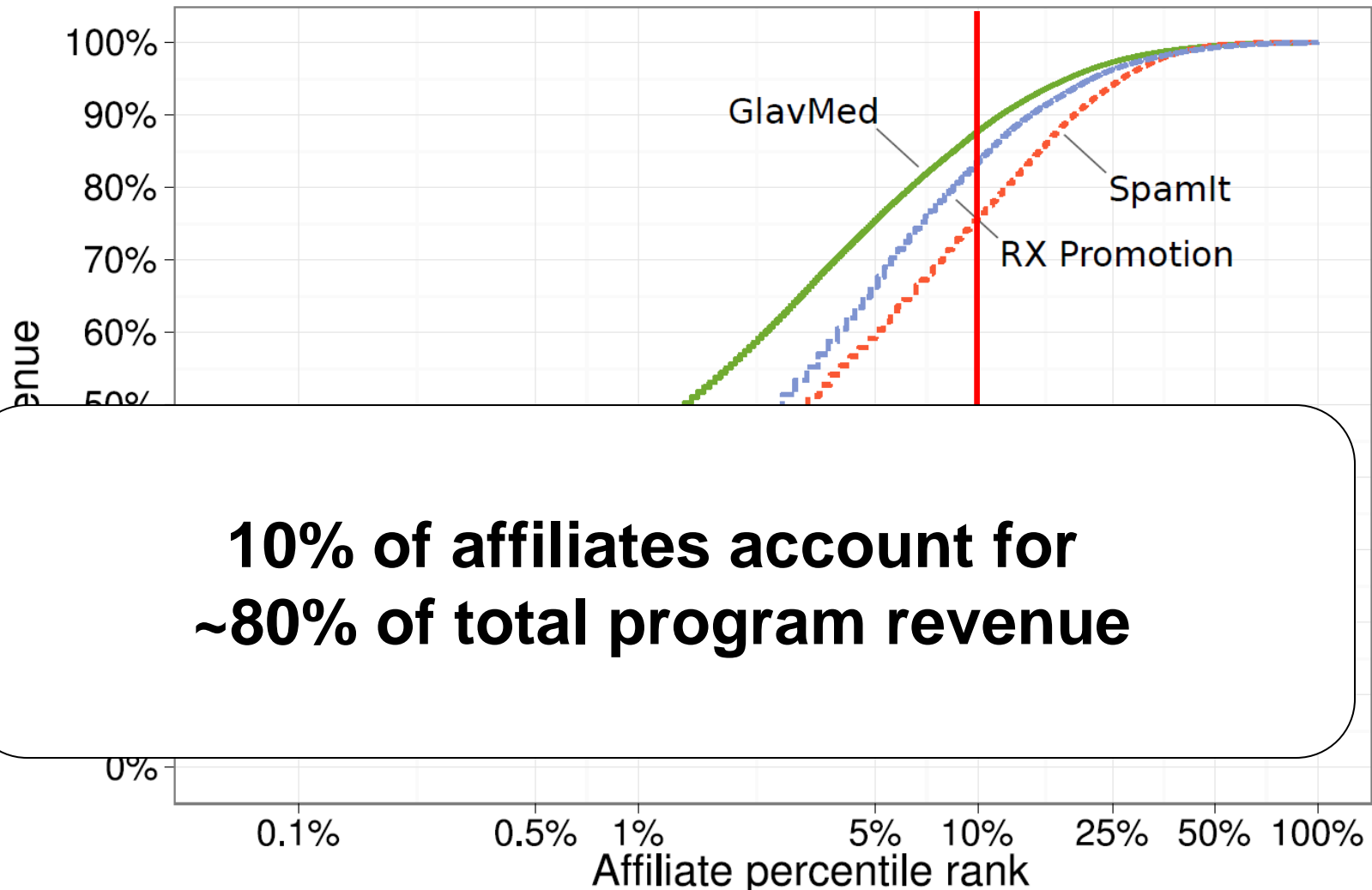
RX-Promotion's Revenue



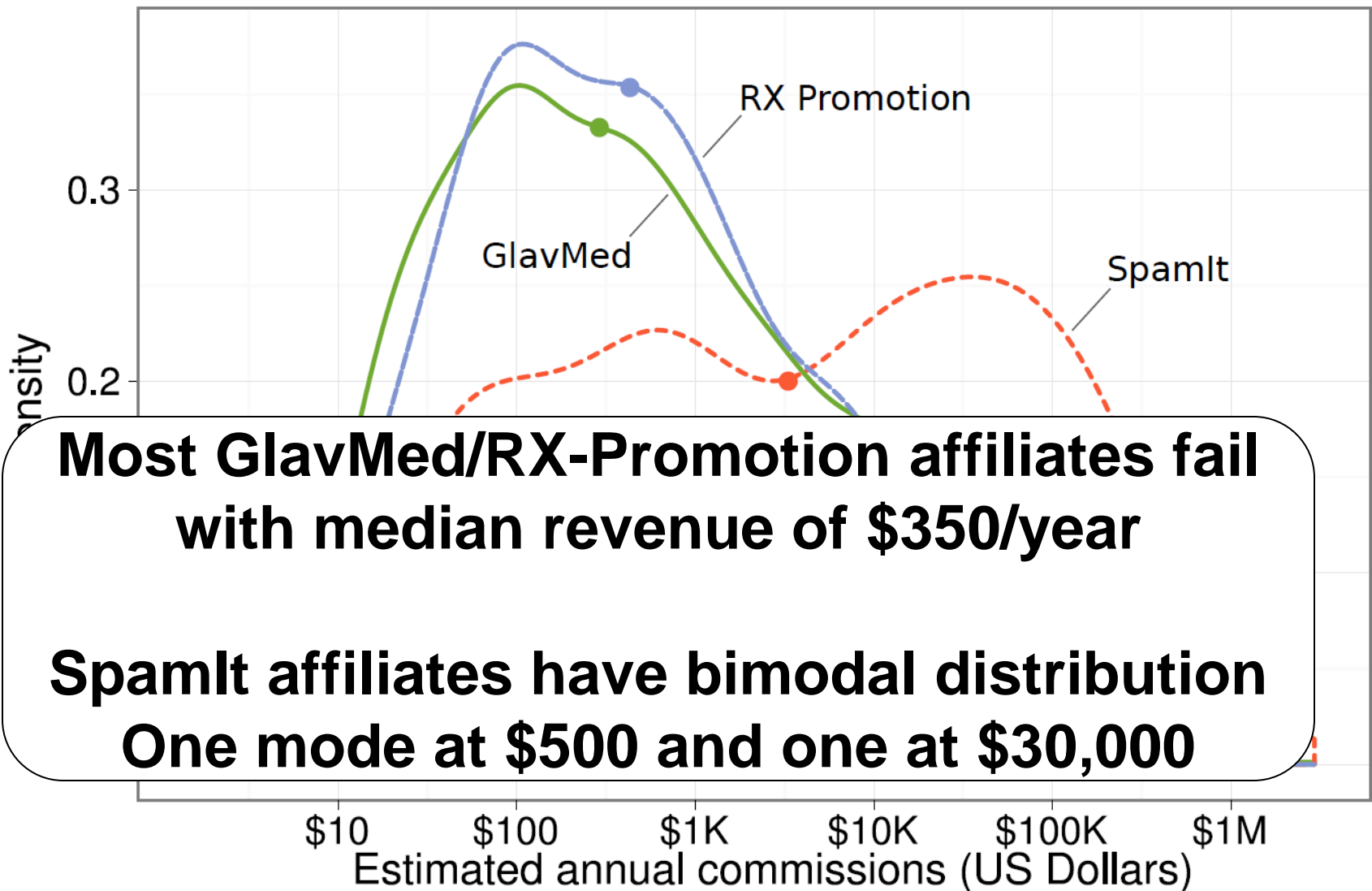
Weekly new customers



Affiliates Revenue



Affiliate Commissions



Top Earning Affiliates

- Botnet email spam can earn large amounts
 - Rustock botnet operator earned \$1.9M
 - Scorrp2 earned \$3M using multiple botnets
- Largest overall earner, webplanet, appears to have earned \$4.6M using Web-based advertising
- Open question as to optimum strategy for spamming?

RX-Promotions Fine Grained Data

Организация: RX-Promotion, система учета: МСФО

В валюте: USD по курсу: 30,4256

Развернуто по Месяцам

ОПУ (Апрель 2010 г. - Сентябрь 2010 г.)

		March	Апрель 2010 г.	Май 2010 г.	Июнь 2010 г.	Июль 2010 г.
БЕЛЫЙ	White	1,351,021	1,428,365.00	986,757.00	589,695.00	695,238.00
Продажа фармацевтических препаратов	Sales of pharmaceuticals		1,428,365.00	986,757.00	589,695.00	695,238.00
ИТОГО ВЫРУЧКА	Total Revenue	1,351,021	1,428,365.00	986,757.00	589,695.00	695,238.00
БЕЛЫЙ	Direct costs	-1,093,827	-1,070,007.00	#####	-495,386.00	-541,890.00
Комиссия банков-эквайеров	Commission acquiring banks	-226,218	-222,308.00	-139,634.00	-75,570.00	-72,326.00
Комиссия банковских агентов	Commission agent bank		-	-	-	-
Прямая банковская комиссия за перевод	Direct bank transfer commission	-908	-2,800.00	-2,425.00	-792.00	-1,499.00
Штрафы платежных систем	Fines Payment Systems	-27,000	-	-25,000.00	-	-18,300.00
Комиссия адвертов	Commission for advertising	-520,352	-532,560.00	-400,760.00	-260,134.00	-295,833.00
Покупка фармацевтических препаратов	Purchase of pharamceuticals	-294,000	-266,455.00	-214,260.00	-135,076.00	(146,50)
Аутсорсинг службы поддержки клиентов	Outsourcing customer service	-25,349	-45,884.00	-19,403.00	-12,774.00	-7,682.00
Отчисления по партнерским программам	Deductions for affiliate programs	-	-	-	-9,039.00	-
Покупка трафика	Terms & conditions	-	-	-	-2,000.00	-
ИТОГО СЕБЕСТОИМОСТЬ	COSTS	-1,093,827	-1,070,007.00	#####	-495,386.00	-541,890.00
В т.ч. внутригрупповая себестоимость	including cost of intra-	-25,349	-45,884.00	-19,403.00	-12,774.00	-7,682.00
ПО ПРОЕКТАМ	Project		358,359.00	185,275.00	94,310.00	153,348.00
RX-Promotion			358,359.00	185,275.00	94,310.00	153,348.00
ИТОГО ГРОСС-МАРЖА	Total Gross Margin	257,194	358,359.00	185,275.00	94,310.00	153,348.00
ИТОГО ДОХОДОВ	Total Revenue	257,194	358,359.00	185,275.00	94,310.00	153,348.00
Административные затраты	Administrative Expenses	-60,955	-87,944.00	-60,708.00	-42,163.00	-59,594.00
Основные затраты связанные с персоналом	Main costs associated w/ staff	-29,506.00	-42,244.00	-26,765.00	-20,769.00	-25,861.00
Расходы на зарплату и бонусы	Salaries and Bonuses	-29,506.00	-42,244.00	-26,765.00	-20,664.00	-25,670.00
Расходы на основную ЗП Россия	Basic RFP Russia	-13,500.00	-13,500.00	-18,650.00	-20,664.00	-21,038.00
Бонус по политике	Bonus Policy	-16,006	(28 ,44)	-8,115.00	-	-4,632.00
Налоги, связанные с персоналом	Taxes related to personnel	-	-	-	(106)	-191.00
Подоходный налог (13%)	Income tax	-	-	-	(35)	-63.00
Пенсионный фонд (20%)	Pension fund	-	-	-	(54)	(98)
Фонд социального страхования (2,9%)	social insurance fund	-	-	-	(8)	(14)
Фед фонд обязательного мед страхования (1,1%)	Fed fund of libigatory medical insurance	-	-	-	-	(5)
Территориальный фонд обязательного мед страхования (2%)	territorial fund of obligatory medical insurance	-	-	-	-	(10)
Фонд социального страхования НС и ПЗ (0,2%)	social insurance fund of the national assembly	-	-	-	(9)	(1)
Затраты на корпоративные мероприятия	Costs of corporate activities		-	-	-	-10,003.00
Затраты на основные корпоративные мероприятия	The cost of major corporate events	-	-	-	-	-10,003.00
Операционные затраты ИТ	IT operating costs	-31,449	-45,700.00	-33,943.00	-21,394.00	-23,731.00
Ремонт и содержание, поддержка и хостинг ИТ оборудования	Repair and maintenance, support and hosting IT equipment	-28,004	(23,060)	(23,640)	(10,004)	(10,220)

Program Direct Cost Structure

Gross margins are around 30%
(optimistic estimate of profits)

	GlavMed & SpamIt		RX-Promotion	
Gross revenue	\$43.3M		\$12.8M	
Direct costs	\$29.4M	(68%)	\$8.6M	(67.1%)
Commissions	\$15.6M	(36%)	\$3.9M	(30.2%)
Suppliers (goods)	\$2.9M	(6.6%)	\$1.0M	(7.6%)
Suppliers (shipping)	\$5.2M	(11.9%)	\$1.5M	(11.5%)
Processing	\$4.3M	(10%)	\$1.3M	(10%)
Refunds	\$1.5M	(3.5%)	\$1.0M	(7.8%)
Gross margin	\$13.8M	(32%)	\$4.2M	(32.9%)

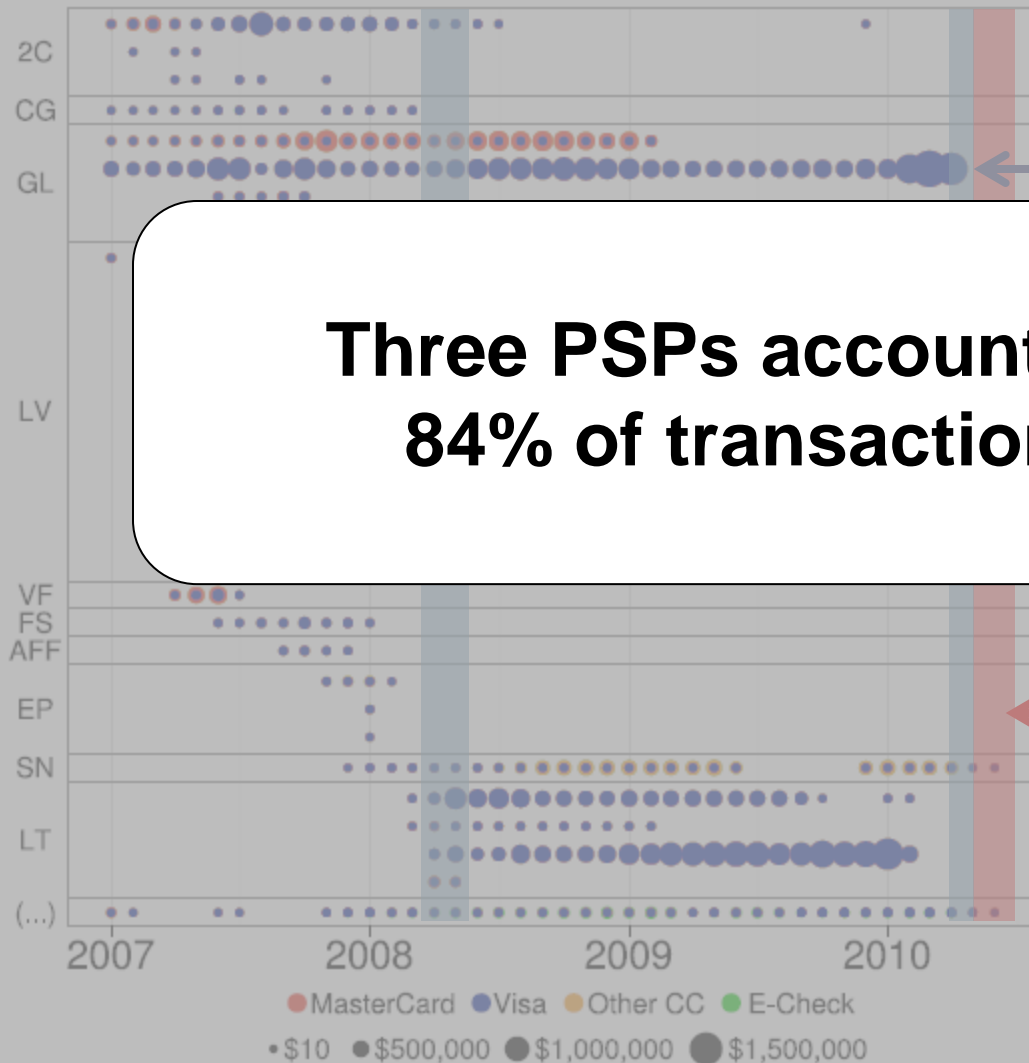
Fine Grained RX-Promo Cost Structure

Direct costs (70.8%)

16.3% net revenue agrees with
chat logs from GlavMed/SpamIt
reporting 10-20%

RX-Promotion March – September 2010		
Gross revenue	\$7.8M	
	\$5.5M	(70.8%)
	\$3M	(38.1%)
	\$1.4M	(17.6%)
	\$1M	(13.2%)
	\$148.3K	(1.9%)
Indirect costs	\$1004K	(12.8%)
Administrative	\$197K	(2.5%)
Customer service	\$124K	(1.6%)
Fines	\$107K	(1.4%)
IT expenses	\$202K	(2.6%)
Domains	\$114K	(1.5%)
Servers, hosting	\$66K	(0.8%)
Selling expenses	\$315K	(4%)
Marketing	\$105K	(1.3%)
Lobbying	\$157K	(2%)
Other indirect	\$134K	(1.7%)
Net revenue	\$1.3M	(16.3%)

GlavMed/SpamIt payment service providers (PSP)



**Three PSPs account for
84% of transactions**

Only one high turnover
remaining

ip with LV
e transactions
L and LT

Revenue declines

Epilogue

6/29/2012

Dear Partners,

As you may have noticed, in the last couple of days we've had **problems with processing**. We don't have a solution yet, and there is no concrete time when it will be resolved.

.....

From this point forward, GlavMed is switching to a "PAUSED" mode. **No new orders will be processed** until the processing issue is resolved.

.....

We urge you to temporarily switch your traffic to other shops/projects.

Все доступные к выплате деньги можно заказывать на вывод. Возможно, что если все разом ломанутся выводить, могут возникнуть некоторые задержки, т.к. общая сумма достаточно велика, но в любом случае, **мы выплатим все до копейки**. За это можете не волноваться.

Большая просьба: все вопросы/замечания/пожелания/слухи постить в этот топик. У меня нет возможности отслеживать все форумы и оперативно отвечать везде и всем.

Саппорт будет работать в штатном режиме. Если по какой-то причине они не могут помочь, или дело совсем плохо и нужна незамедлительная психологическая помощь, то **можно обращаться ко мне напрямую в этот джаббер: dontworry@behappy.com.ru**

Новость, конечно, неприятная, но не смертельная. Поэтому прошу не разводить панику, а обсуждать возникающие вопросы по существу.

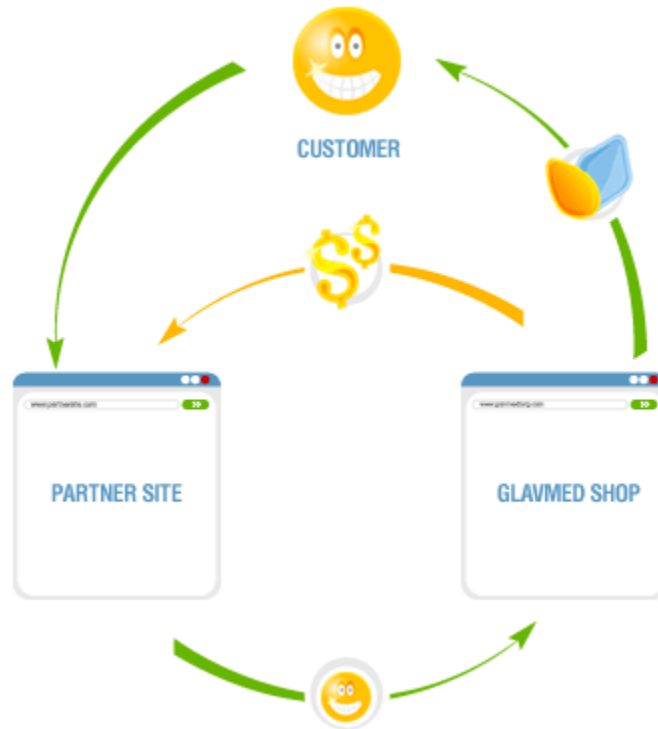
ГлавМед - Фармовый динозавр. Не быстрый, но, сука, надежный!
<http://www.glavmed.com> ☞ Теперь ОНО еще и разговаривает

Quote

Conclusions

- Small number of advertisers generate most of the revenue
- Market is not saturated
- Affiliate programs have substantial costs and net revenues are around 15-20% of gross
- Three payment processors were responsible for processing 84% of the transactions for GlavMed/SpamIt

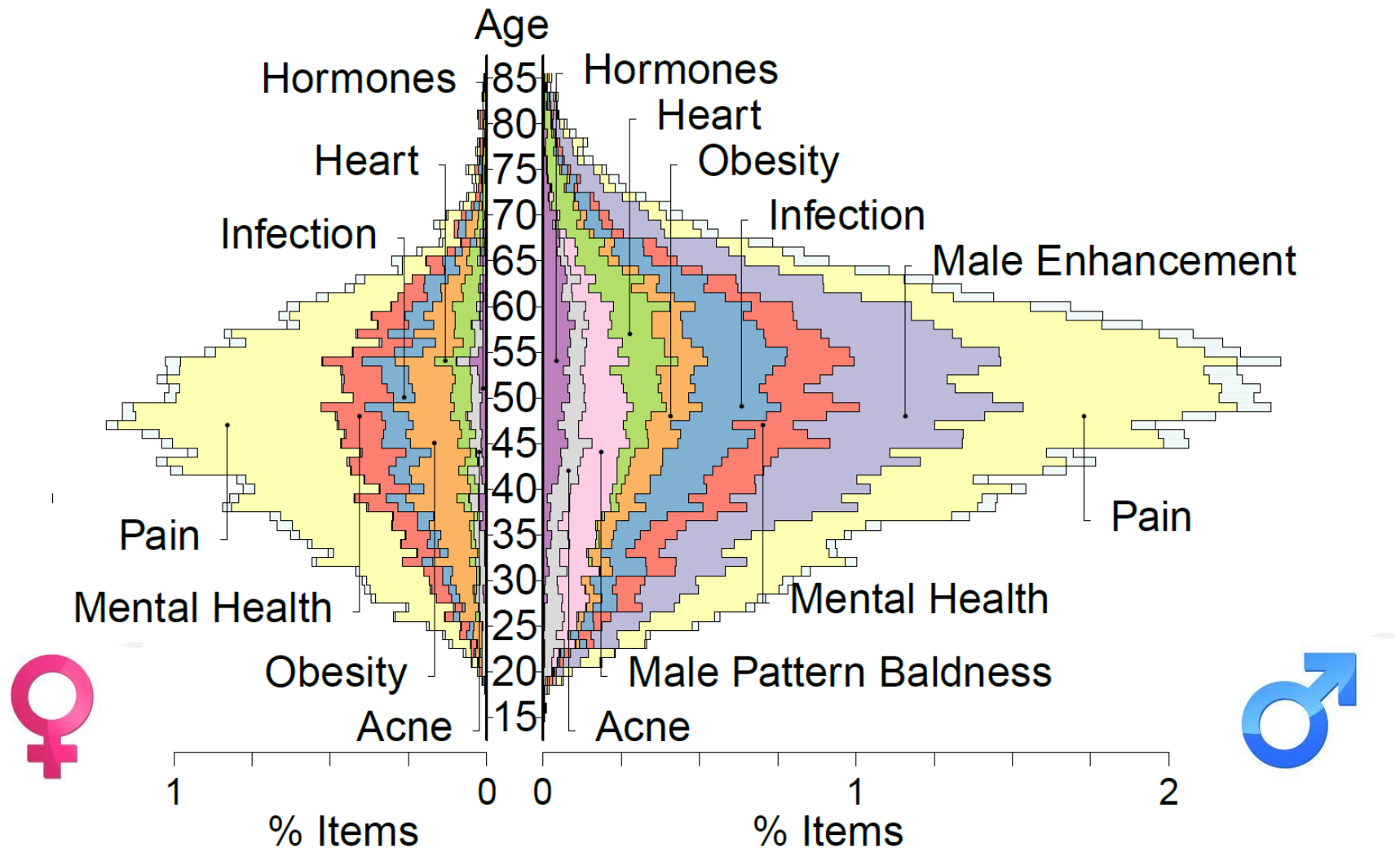
Questions?



Authenticity and Ethics of Data Set

- Authenticity
 - We found concordance between chat logs and transactional data
 - We found test purchases placed by us in the appropriate data set with the correct values
- Ethics
 - Data is already broadly available
 - Anonymize personally identifiable customer data
 - Use non-identifiable code-names for other stakeholders

Products Without ED



Previous Affiliate Program Studies

Levchenko et al. Click Trajectories: End-to-End Analysis of the Spam Value Chain
IEEE Security and Privacy 2011

- 969 Million spam emails analyzed
- Inferred relationship between affiliate programs and banks from trace purchases

Kanich et al. Show Me the Money: Characterizing Spam-advertised Revenue
Usenix Security 2011

- Inferred affiliate program revenue
- Inferred customer composition and products based on network traces

<i>Affiliate Program</i>		<i>Distinct Domains</i>	<i>Received URLs</i>	<i>Feed Volume</i>
RxPrm	RX-Promotion	10,585	160,521,810	24.92%
Mailn	Mailien	14,444	69,961,207	23.49%
PhEx	Pharmacy Express	14,381	69,959,629	23.48%
EDEx	ED Express	63	1,578	0.01%
ZCashPh	ZedCash (Pharma)	6,976	42,282,943	14.54%
DrMax	Dr. Maxman	5,641	32,184,860	10.95%
Grow	Viagrow	382	5,210,668	1.68%
USHC	US HealthCare	167	3,196,538	1.31%
MaxGm	MaxGentleman	672	1,144,703	0.41%
VgREX	VigREX	39	426,873	0.14%
Stud	Stud Extreme	42	68,907	0.03%
ManXt	ManXtenz	33	50,394	0.02%
GlvMd	GlavMed	2,933	28,313,136	10.32%
OLPh	Online Pharmacy	2,894	17,226,271	5.16%
Eva	EvaPharmacy	11,281	12,795,646	8.7%
WldPh	World Pharmacy	691	10,412,850	3.55%
PHOL	PH Online	101	2,971,368	0.96%
Aptke	Swiss Apotheke	117	1,586,456	0.55%
HrbGr	HerbalGrowth	17	265,131	0.09%
RxPnr	RX Partners	449	229,257	0.21%
Stmul	Stimul-cash	50	157,537	0.07%
Maxx	MAXX Extend	23	104,201	0.04%
DrgRev	DrugRevenue	122	51,637	0.04%
UltPh	Ultimate Pharmacy	12	44,126	0.02%
Green	Greenline	1,766	25,021	0.36%
Vrlty	Virility	9	23,528	0.01%
RxRev	RX Rev Share	299	9,696	0.04%
Medi	MediTrust	24	6,156	0.01%
ClFr	Club-first	1,270	3,310	0.07%
CanPh	Canadian Pharmacy	133	1,392	0.03%
RxCsh	RXCash	22	287	<0.01%
Staln	Stallion	2	80	<0.01%
	Total	54,220	346,993,046	93.18%

Products and Revenue

Product	GlavMed		SpamIt		RX-Promotion	
	Orders	Revenue	Orders	Revenue	Orders	Revenue
<i>ED and Related</i>	580K (73%)	\$55M (75%)	670K (79%)	\$70M (82%)	58K (72%)	\$5.3M (51%)
Viagra	300K (38%)	\$28M (38%)	290K (34%)	\$31M (36%)	33K (41%)	\$2.7M (27%)
Cialis	180K (23%)	\$19M (26%)	190K (22%)	\$23M (27%)	18K (22%)	\$1.9M (19%)
Combo Packs	49K (6.1%)	\$3.9M (5.4%)	110K (14%)	\$8.4M (9.8%)	5100 (6.4%)	\$350K (3.4%)
Levitra	32K (4.1%)	\$3.2M (4.4%)	35K (4.2%)	\$3.9M (4.5%)	1200 (1.5%)	\$150K (1.5%)
<i>Abuse Potential</i>	48K (6.1%)	\$4.5M (6.1%)	64K (7.6%)	\$6.2M (7.3%)	11K (14%)	\$3.3M (32%)
<i>Painkillers</i>	29K (3.7%)	\$2.4M (3.3%)	53K (6.3%)	\$4.7M (5.5%)	10K (13%)	\$3.0M (29%)
<i>Opiates</i>	—	—	—	—	8000 (10%)	\$2.7M (26%)
Soma/Ultram/Tramadol	20K (2.5%)	\$1.8M (2.4%)	46K (5.5%)	\$4.1M (4.8%)	1000 (1.3%)	\$150K (1.5%)
<i>Chronic Conditions</i>	120K (15%)	\$9.5M (13%)	64K (7.6%)	\$5.2M (6.1%)	8500 (11%)	\$1.3M (13%)
<i>Mental Health</i>	23K (2.9%)	\$2.1M (2.9%)	16K (1.9%)	\$1.4M (1.7%)	6000 (7.4%)	\$1.1M (11%)
<i>Antibiotics</i>	25K (3.2%)	\$2.1M (2.9%)	16K (1.9%)	\$1.4M (1.6%)	1300 (1.6%)	\$97K (0.9%)
<i>Heart and Related</i>	12K (1.5%)	\$770K (1.1%)	9700 (1.2%)	\$630K (0.7%)	390 (0.5%)	\$35K (0.3%)
<i>Uncategorized</i>	48K (6.0%)	\$4.0M (5.5%)	47K (5.6%)	\$3.9M (4.6%)	2400 (3.0%)	\$430K (4.2%)

ED sales
dominate

Selling controlled
drugs is profitable