

Title:

Enabling Citizen's Advice Bureau (CAB) to spot trending issues in society before they grow worse

Abstract:

The DataKind UK team is assisting the CAB to make sense of online usage of their services and in-person visits to their centres. They have more offices in the UK than Tesco has shops and data going back 10+ years of every person they assisted classified by problem type and location.

A Datakind UK team of data scientists and engineers was given access to 3 types of anonymised data:

1. All of CAB's Google Analytics data on their advice guide website (a self-help version of going into one of their offices)
2. The records of all physical office visits for the ~2M people and ~6M issues CAB handles per year. These include a date, an office ID, and the issue code the person was seen for.
3. The roughly 50K/year detailed write ups of critical cases from the office visits. These have 6 text fields and about 40 demographic fields.

They indexed all of these data sets in Elasticsearch and normalised across all their fields, so that they were searchable across any of the common fields (date, location, issue code). As part of the project, custom systems to allow deep exploration of the each of the data types individually. They then built a Kibana 4 dashboard on top of all of this to allow CAB staff do the data exploration themselves. The project goal is to enable CAB staff to surface emergent trends and see the connections between disparate data sets so that CAB can provide tailored counselling and to lobby government on new issues such as payday lending.

Citizens Advice & ElasticSearch

Peter Passaro & Ian Ansell





Our services

2013/14



318 member bureaux in England and Wales (F2F phone, web-chat, email/letter)
2,500+ regular community locations
1,000+ ad-hoc locations



Consumer advice service (phone, email/letter)
in England, Wales and Scotland

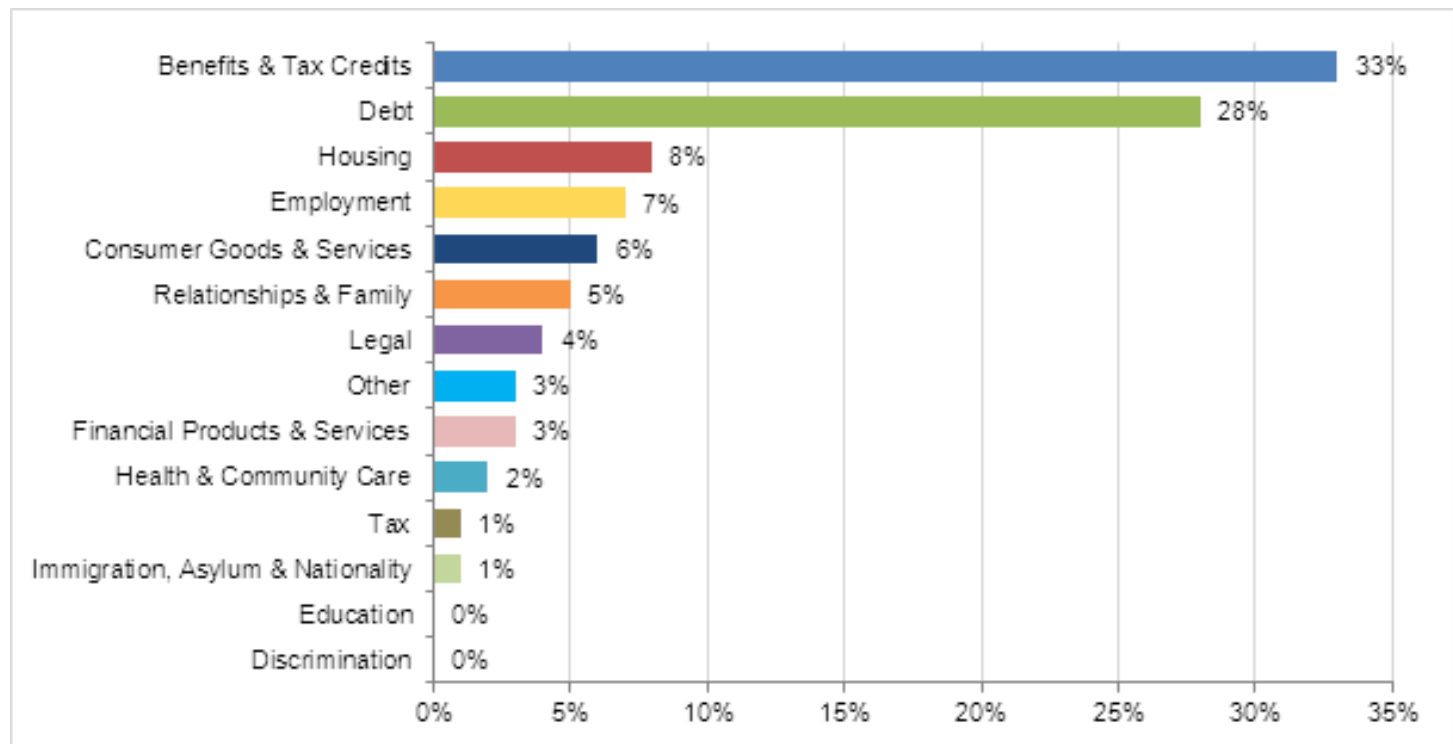


Our website 'Adviceguide' providing extensive self-help information on a wide range of topics.

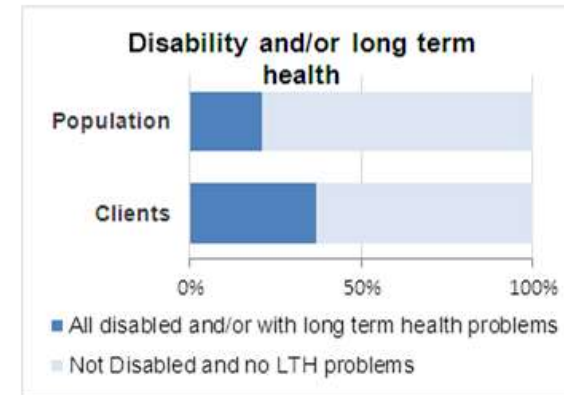
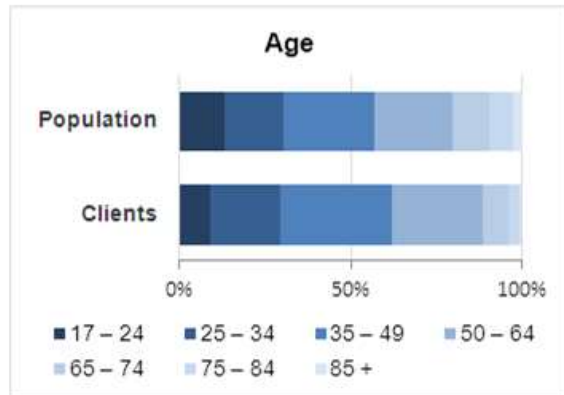
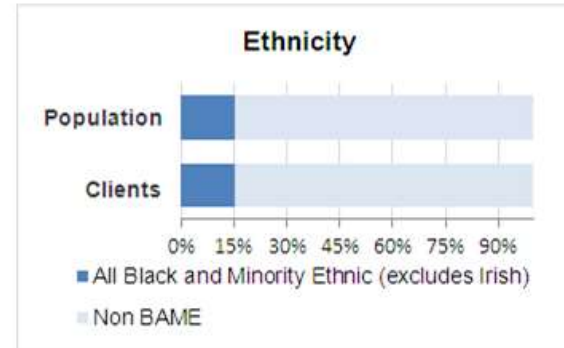
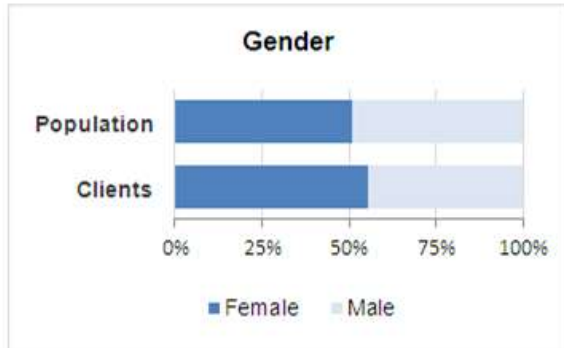
The data we have - Bureau

Citizen Advice: Advice Issue Code Statistics Q2 2014-15												
Q3 2012-13 to Q1 2013-14 figures have been restated due to changes in gateway recording to allow meaningful comparisons				2011-12	2011-12	2011-12	2011-12	2012-13	2012-13	Adjusted 2012-13	Adjusted 2012-13	Adjusted 2013-14
AIC1	AIC2	AIC 3		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
BEN	02 Income Support	NO Gateway		6,099	6,977	7,043	8,422	6,994	7,349	2,828	2,223	
BEN	02 Income Support	A Eligibility, entitlement, calc.		7,648	7,741	6,882	7,168	6,312	5,940	6,943	7,179	
BEN	02 Income Support	B Poor administration		890	837	808	812	658	640	826	881	
BEN	02 Income Support	D Changes of circumstances		1,396	1,477	1,400	1,385	1,217	1,180	1,312	1,331	
BEN	02 Income Support	DA Civil penalties		0	0	0	0	0	0	0	0	
BEN	02 Income Support	DB Challenging a decision (not appeals)		0	0	0	0	0	0	0	0	
BEN	02 Income Support	E Appeals		1,976	2,057	1,982	2,152	1,982	1,732	2,002	2,236	
BEN	02 Income Support	F Backdating		401	384	324	332	278	295	365	347	
BEN	02 Income Support	G Housing costs(home owners)		736	712	603	573	485	472	526	523	
BEN	02 Income Support	K Sanctions and hardship loans/payments		110	104	72	84	54	49	103	87	
BEN	02 Income Support	L Alleged fraud, error and disputes (not appeals)		462	522	467	510	384	325	376	364	
BEN	02 Income Support	M Work-focused interviews		46	36	29	30	20	21	36	26	
BEN	02 Income Support	MA The Work Programme		0	0	0	0	0	0	1	0	
BEN	02 Income Support	S Co-habitation		199	222	199	226	189	203	171	233	
BEN	02 Income Support	T Direct deductions rules		177	132	152	144	116	109	108	132	
BEN	02 Income Support	X Premium		0	0	0	0	0	0	0	0	
BEN	02 Income Support	Y Making and managing a claim		1,352	1,534	1,397	1,419	1,256	1,374	1,482	1,595	
BEN	02 Income Support	Z Other		1,103	1,301	1,179	1,183	975	957	1,134	1,142	
BEN	02 Income Support total			22,595	24,036	22,537	24,440	20,920	20,646	18,215	18,300	18,300
BEN	03 Pension Credit	NO Gateway		4,541	4,778	4,487	6,558	4,690	5,128	2,108	1,864	
BEN	03 Pension Credit	A Eligibility,entitlement,calc.		8,243	8,295	7,630	8,891	7,153	7,107	8,080	9,137	

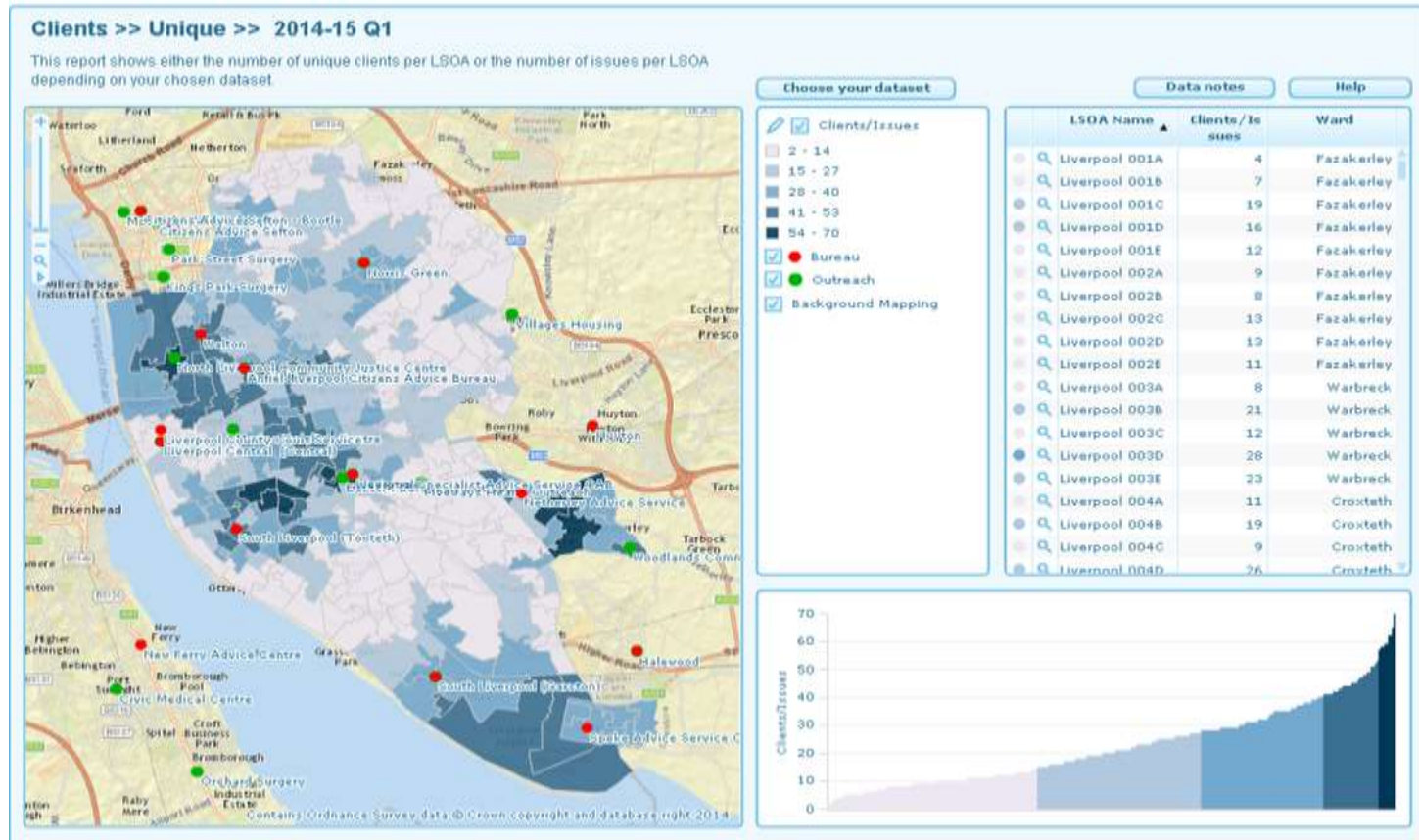
The data we have - Bureau



The data we have - Bureau



The data we have - Bureau



The data we have - Bureau

Citizens Advice Constituency Dashboard 2014 - Worcester

Citizens Advice Service England and Wales 2013/14:

Unique clients advised	2013/14	2m
Problems dealt with	2013/14	5.5m
Community locations	2013/14	>3000

Worcester in 2013/14

Citizens Advice Bureaux dealt with:

Clients	2013/14	6,832
Problems	2013/14	28,176

The main problem areas were:

Problems	2013/14	%
Benefits	6,200	31%
Debt	2,647	13%
Housing	1,209	6%
Employment	5,286	26%

The top 5 benefit issues were:

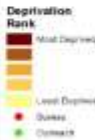
Problems	2013/14	%
7 Housing Benefit	1,117	18%
19 Employment Support Allowance	1,036	16%
11 Jobseekers Allowance	967	8%
10 Working/Child Tax Credits	946	8%
22 Localised social welfare	376	6%

The top 5 debt issues were:

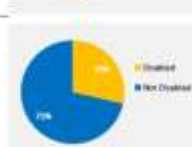
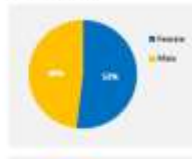
Problems	2013/14	%
13 Credit/overseas card debts	351	13%
14 Unsecured personal loan debts	344	13%
9 Council tax, council chg arrears	221	8%
5 Telephone and broadband debts	168	6%
7 Rent arrears-hg assoc	143	5%

Key housing issues:

Problems	2013/14	%
Threatened homelessness	166	13%
Actual homelessness	626	51%



Client Profile:



The data we have - Befes

Michelle Tiler
last seen yesterday at 10:27

When I do get work I pay one of the local mothers £25 a day to look after him coz the nursery is mostly fully booked.
Its a tad cheaper than the nursery and im lucky that I found someone I can trust to take him and my dog. Also hubby gets sent away with the army so I can't always rely on him being round to help 11:55

And I have no local family which could help, so mostly im on my own 11:57

Good and bad to being self-employed...overall
Ruth, Martin's partner, writes:

As the partner of a self-employed person, I sometimes feel like we have it really good, but also pretty tough too. It's great that Martin can be so flexible, and we can plan our diaries together so that he has the children when I need to work late, and so on. I think we now take this for granted, and I know I'd find it very difficult if we had to start getting approval from someone before we booked a holiday or planned a family day out.

At the same time, though, I think there are a lot of pressures and stresses attached to being self-employed. For example, at the moment Martin's not that busy and there's an inevitable worry at the back of his and my mind about what if that carries on, and what it might mean for us in the longer term. Also, with no paid sick leave, paternity pay etc, there's a temptation to work really hard, and endlessly. Martin did a job when our son was just four days old - he didn't really have a choice as it needed doing and he did not want to lose a valued customer. But then you hear of announcements like Milliband's plans to extend paternity leave to four weeks. Four weeks off for us would have been a dream, and completely unrealistic. So, good and bad to being self-employed...overall.

My pension plans will be state pension
Karen, a craft worker, writes:

My pension plans will sadly be state pension (if it still exists) through my national insurance stamp and 2 very small ex employment pensions. Not really making enough to put money aside for my retirement and with the way retirement ages are going it likely be dead before I can access my state pension

Absolutely I'm worse off self-employed as being an employee I would have a company contribution to a private pension likely

There is my credit union savings but they generally get used in an emergency and not as a long term view to my pension

Kevin Painter / Decorator
last seen yesterday at 13:45

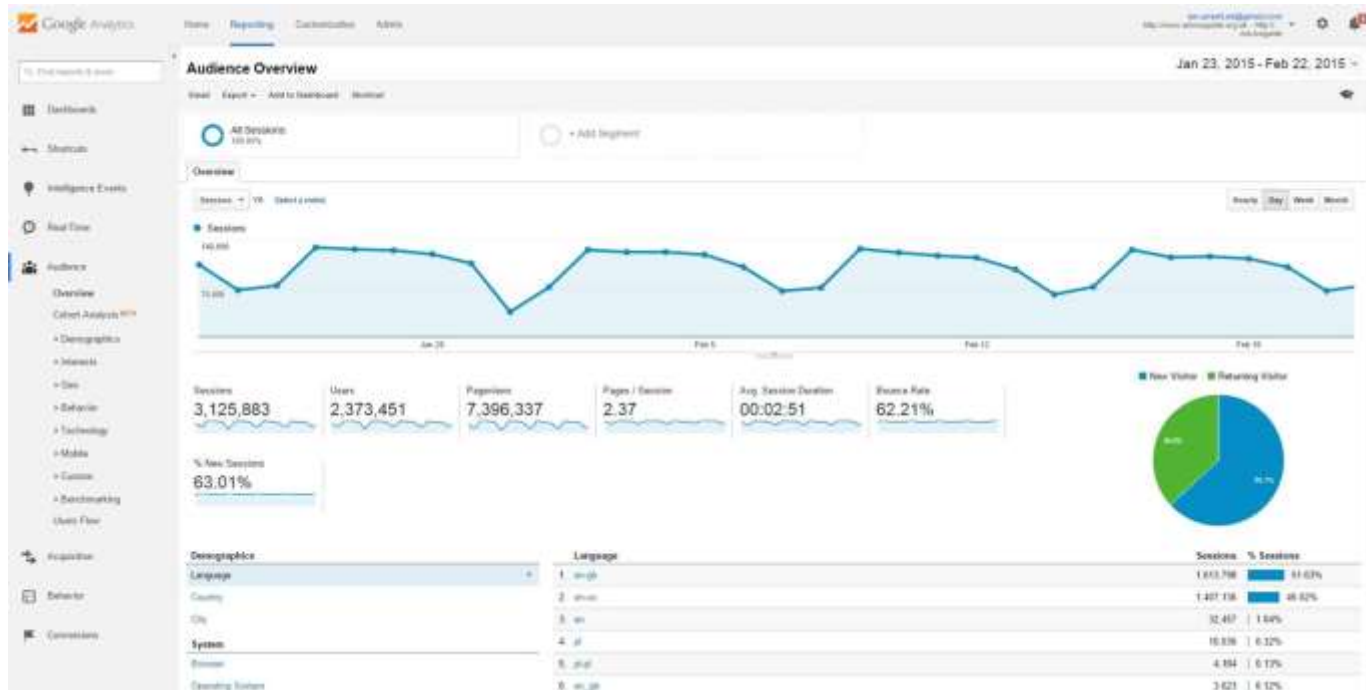
Hi Tom, I have managed to save 4 grand over two years for a deposit.. with the help of living at home but its been in dribs and drabs due to instability of pay. I cannot ever imagine saving for retirement or retiring.. I probably will end up like my dad and work till I drop!

Dan Company Director
last seen yesterday at 12:14

I don't currently do any saving in

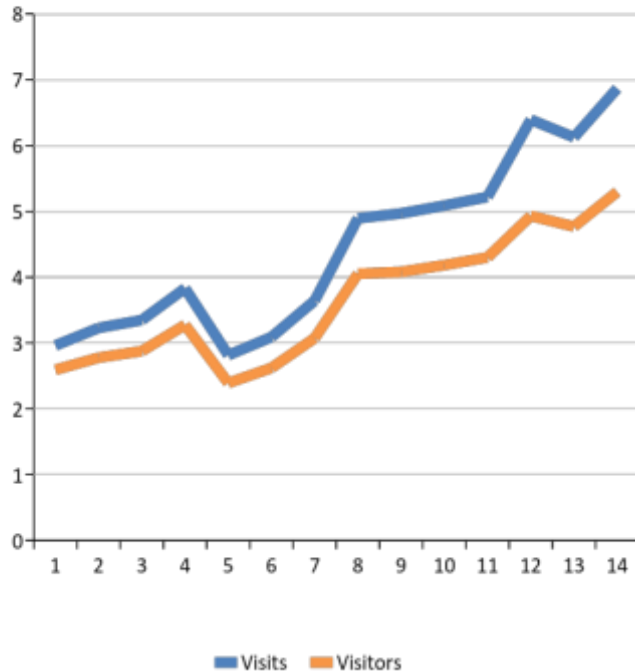
Pension saving: It's all greek to me at the minute
Martin writes:

The data we have - Adviceguide

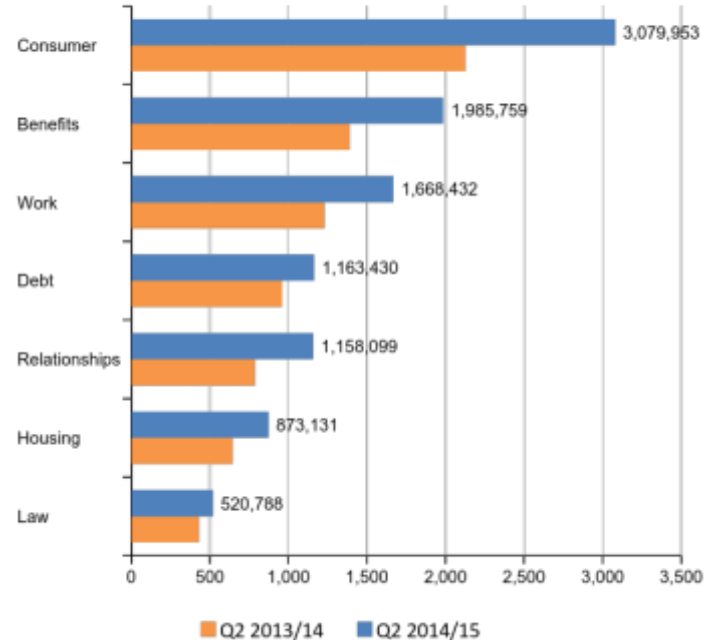


The data we have - Adviceguide

Adviceguide continues to show a dramatic increase in use. Visitors are up 27% and visits are up 35%.



Overall page views have increased by 37%.
Consumer has increased by 52%



Special 75th anniversary edition

Barometer



Citizens Advice first opened its doors offering people face to face advice on 4 September 1939, days after the Second World War broke out. Three quarters of a century later we're celebrating 75 years of providing free and impartial advice which is now available in person, over the phone and online.



Helped 2 million people
Top issue: Employment and support allowance

2013/14



Dealt with 1.2 million calls
Top issue: Second hand cars

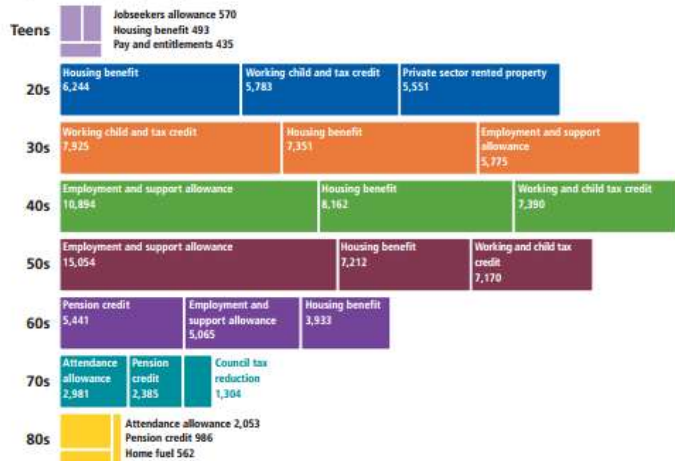
2013/14



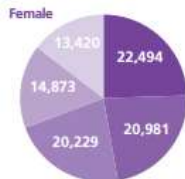
16 million people
Top issue: Basic rights at work

2013/14

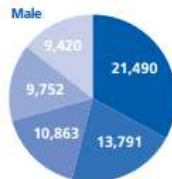
Top issues by age reported to CAB (April – June 2014)



Top five issues by gender



- Housing benefit
- Employment and support allowance
- Working and child tax credit
- Council tax arrears
- Divorce, separation, dissolution

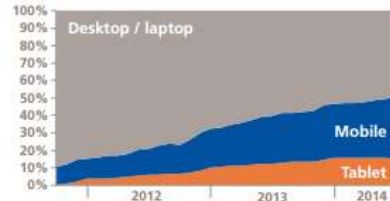


- Employment and support allowance
- Housing benefit
- Jobseeker's allowance
- Personal independence payments
- Council tax arrears

Adviceguide clock: top searches which bring people to our self help website over 24 hours



As many people now access Adviceguide on their mobile or tablet



People need Citizens Advice as much now as they ever have done over the past 75 years. Our staff and 21,000 volunteers are working tirelessly to make sure everyone can get advice when they need it and in a way that suits them. We're proud of our history, but are not complacent about what new problems people will face.

Citizens Advice has been offering the free and impartial advice people need for 75 years, and we're ready to keep doing this for the next 75 years and beyond.

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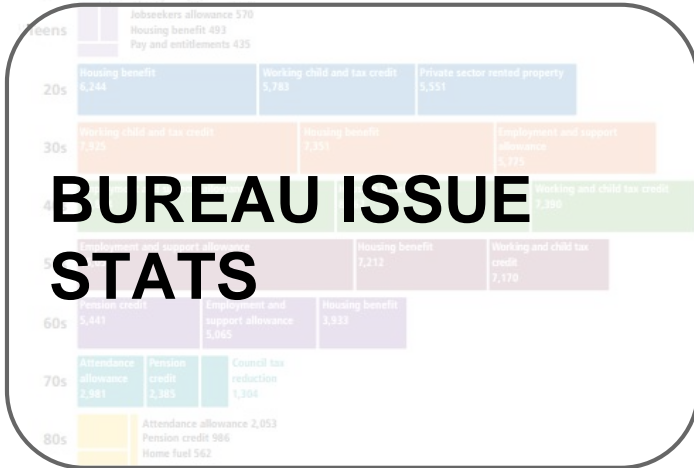
2013/14



16 million people
Top issue: Basic rights at work

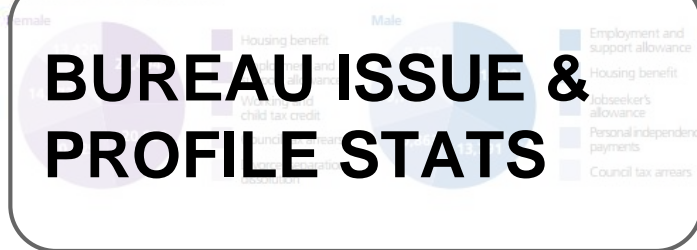
2013/14

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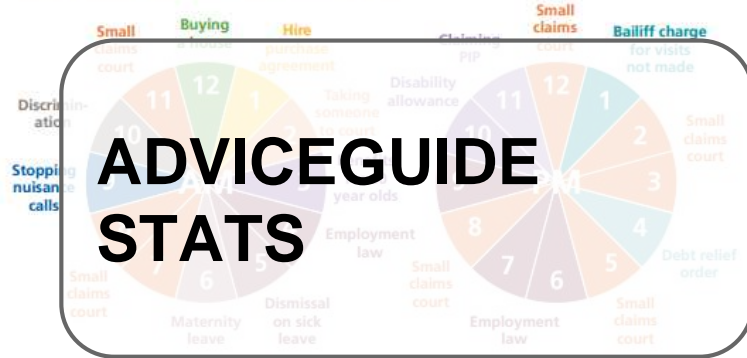
BUREAU ISSUE STATS

Top five issues by gender



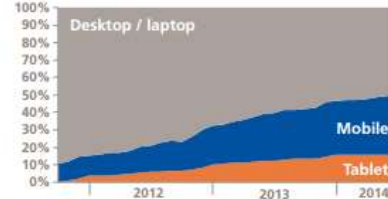
BUREAU ISSUE & PROFILE STATS

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ADVICEGUIDE STATS

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Data strategy

Using our evidence to effect change

Putting data in the hands of users

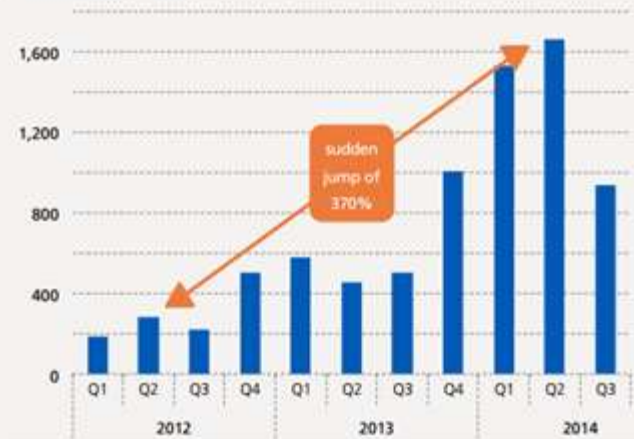
The problem

How do we:

1. enable users to ask questions of the data
1. identify new emerging trends

Figure 4.3 Last year we saw a sudden spike in calls about slimming pills

Total number of cases dealt with by the Citizens Advice consumer service in relation to slimming products and services:



Source: Citizens Advice consumer service statistics



Identifying spike and new issues - where are the next payday loans?

Emerging Issue – Subscription Traps (via Slimming Pills)

Slimming product/service cases have risen sh..

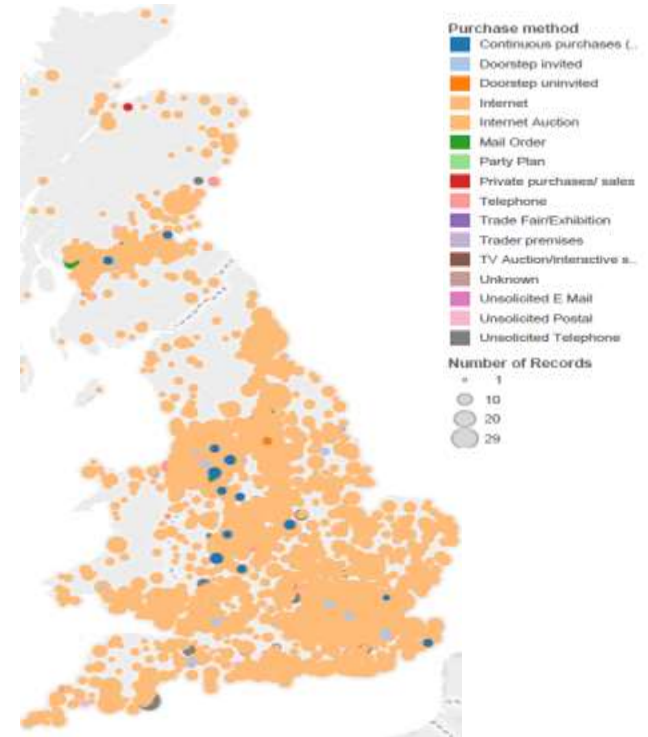
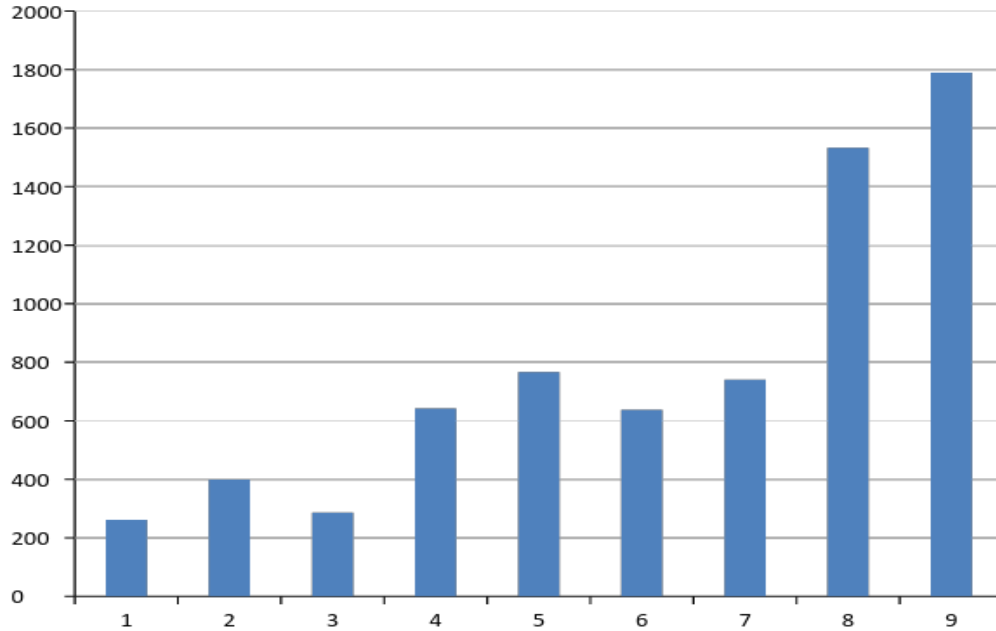
87% of these cases involve internet payments by debit o..

This compares to only 8% for all Consumer Service c..

Most of these cases involve misleading claims/omissions or ..

With the internet as the main purchase method, these case..

The term 'free trial' appears in over 50% of case notes



PP to discuss data corps project

What does DataKind do?

The logo for DataKind UK (DKUK) is located in the top right corner. It consists of the letters 'DKUK' in a bold, sans-serif font. The 'DK' is white and the 'UK' is dark blue, all set against an orange square background.

Mission: “Data for Good”

Charity that provides other charities and public organisations with Data Science services using a volunteer workforce

Activities: [DataDives](#) & [DataCorp](#) projects

DataDive: WEEKEND WARRIOR

Data Ambassadors:

- Liaise with the Charity
- 6-8 Weeks to Understand, Clean, and Prep Data
- Lead the Teams at the DD

Volunteers:

- Weekend of Exploration
- Find the Most Valuable Insights for the Charity in the Time you have
- Share what you've done

DataCorps: LONG TERM COMMITMENT

- Scope the Charity's Needs
- Understand their Data and Technology Ecosystem
- Develop Realistic Project Goals and Organisation
- Motivate your Team
- Pick a project you can commit to - Excitement is key!
- Share and Communicate



Citizens Advice
the charity for your community

DataDive 1 - The Original CAB Brief:

- Find The Next “Payday Loans”
 - Develop an Issues Early Warning System
- Give Them More Visibility on their Data
 - Closer to Real-Time
 - Integrate their Data Sets



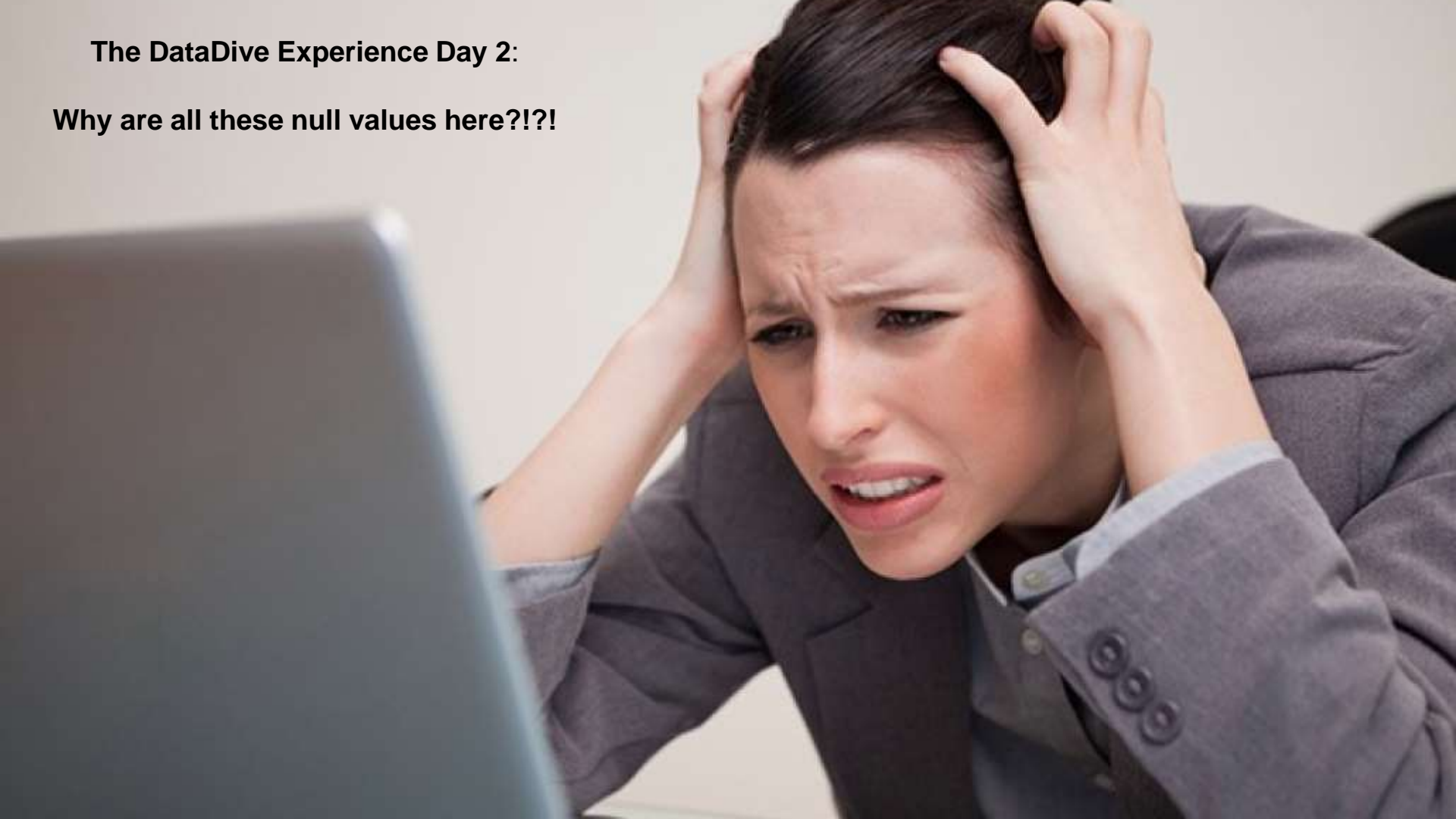


The DataDive Experience Day 1:

**I can solve all the problems
of the world with my
AWESOME DATA SCIENTIST POWERS!**

The DataDive Experience Day 2:

Why are all these null values here?!?!



DataDive 1: What do we do with all this delicious data?

- **Bureau Visits** (Visitors and their Issues)
- **Evidence Forms**
- **Google Analytics**

What is the central theme across the organisation?

Issue Codes!

Bureau Visits

- Timestamp
- Issue Code
- Bureau ID
- Client ID

~2M visits/yr
~6M issues/yr

**Trends & Issues
Exploration**

Evidence Forms

- Timestamp
- Issue Code
- Bureau ID
- Client ID
- 6 Text Fields
- ~40 Demographic Fields

~ 50K Forms/yr

**Topic Analysis & Issues
Exploration**

Google Analytics

- Timestamp
- **NO ISSUE CODE!**
- Sessions
- Users
- New Users

~ 16M Unique Users

**Issue Code Labelling &
Data Pipelining**

Elasticsearch At DataDive 1: Evidence Form Exploration

Easy to get Data into ES

Roll your own CSV import script or... <https://github.com/playnetwork/esimport>
`python -m esimport -s myserver:9200 -f /path/to/import/data.file -i myindex -t mytype`

Easy to Explore Data via the RESTful API

```
curl -XGET 'http://localhost:9200/ebefs/_search' -d '{
  "query" : {
    "term" : { "impact_of_the_issue" : "homeless" }
  }
}'
```

CAB DataCorps Project: How do we carry forward the DataDive work into a deliverable?

- Grand Ambition - build a prediction engine
- Needed trends across all three data types
- External data?
- Evidence Forms - Better Topic Modelling
- Bureau Visits - look for emerging issues
- GA Data - issue code labelling and pipeline completion
- User Interface

DataDive 2: CAB Shares Their Data

St Mungo's Broadway

Northeast Child Poverty Action Committee

Elasticsearch is set up as the repository for
Evidence Forms

Elasticsearch and Kibana Save the Day

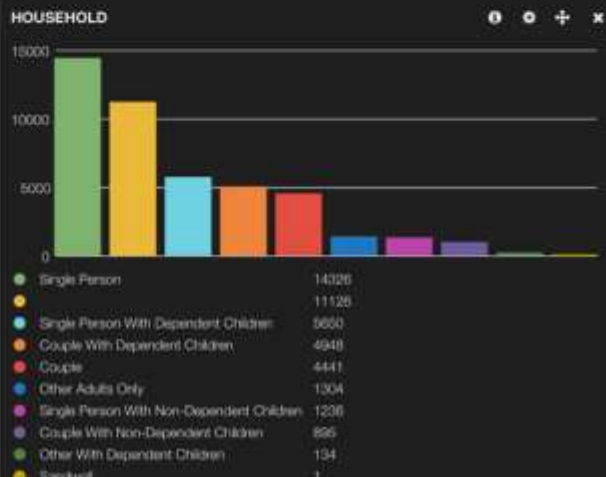
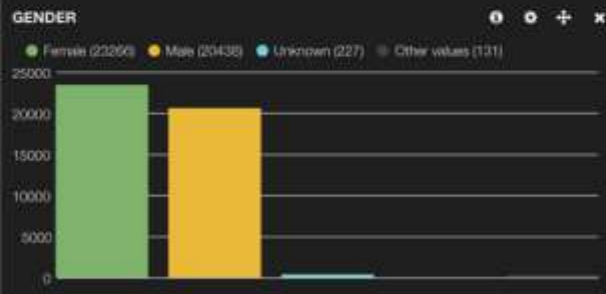
DataDive 2:

- We were struggling to get good predictions because of a lack of contextual data
- Trend analysis was difficult because of changes in data collection
- We already had all the evidence forms in Elasticsearch for topic analysis
- Team member Ian Huston (Pivotal) started using Kibana to explore the data



NATIONALITIES

Term	Count	Action
UK - British	22564	🔍 🗑️
Poland	564	🔍 🗑️
Other Europe EU	426	🔍 🗑️
Lithuania	184	🔍 🗑️
Portugal	173	🔍 🗑️
Latvia	145	🔍 🗑️
Other Africa	139	🔍 🗑️
Italy	117	🔍 🗑️
Czech Republic	76	🔍 🗑️
Eire (Republic of Ireland)	34	🔍 🗑️
Missing field	0	🔍 🗑️
Other values	19540	

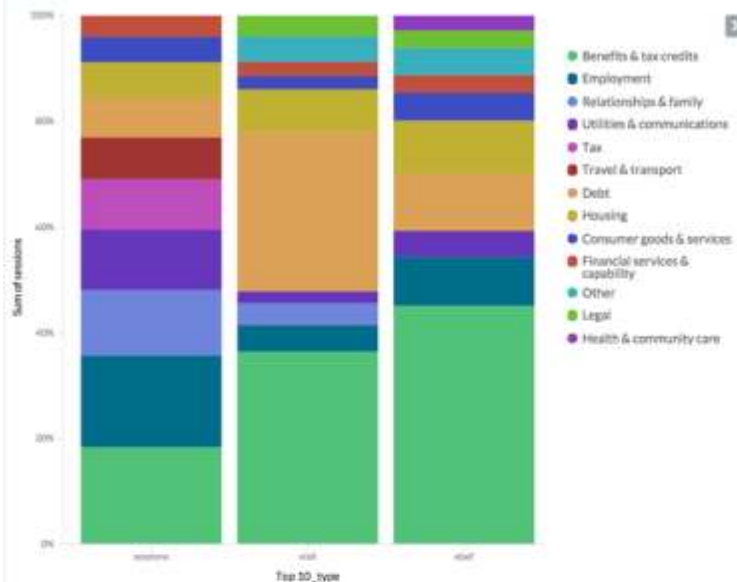


Focus Becomes the Dashboard

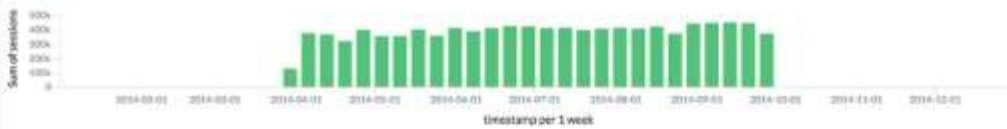
Final data clean up and normalisation

- Put everything into Elasticsearch
- Normalise issues codes across all 3 data types
- Other Minor field normalisation
- Enrich geo data for bureau visits and evidence forms
- Evidence Forms - full topic modelling

AIC 1 breakdown by dataset



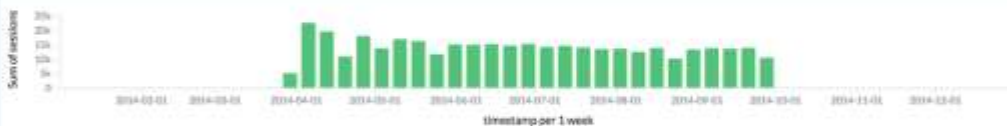
Adviceguide Google Analytics records



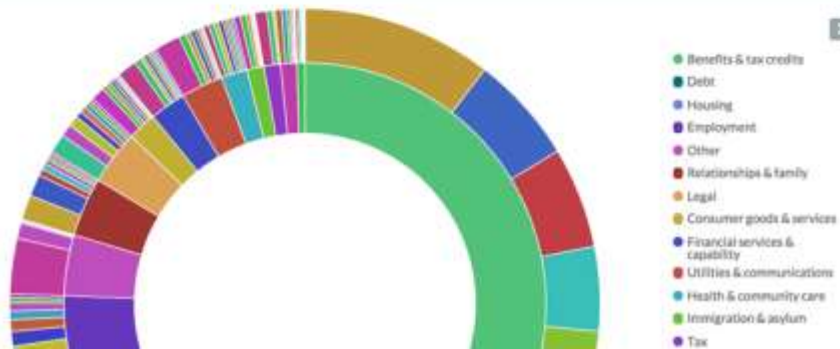
EBEFs records



Bureau Visits records



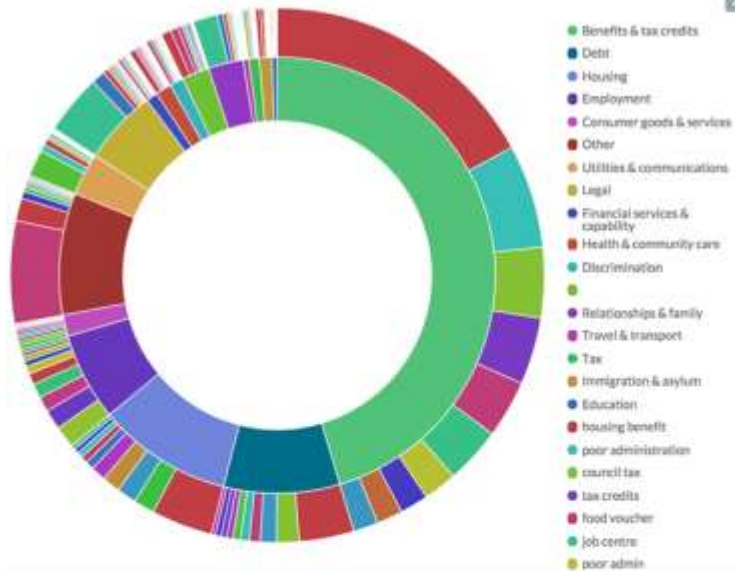
AIC 1 and common AIC 2



Location of visits and EBEFs (by originating member office)



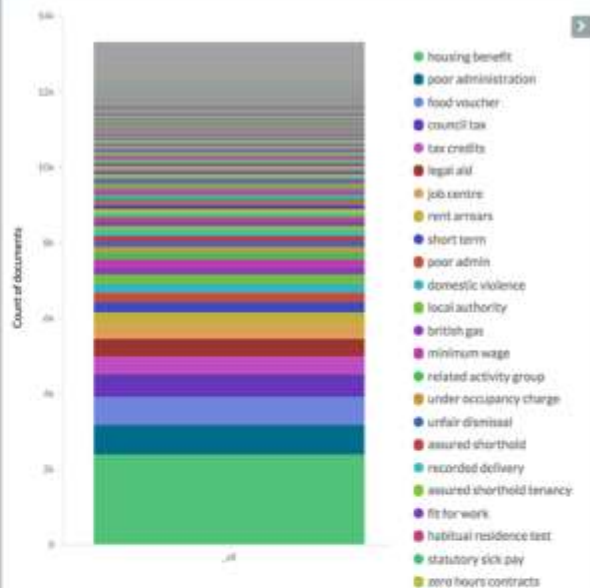
AIC 1 Codes vs Topics



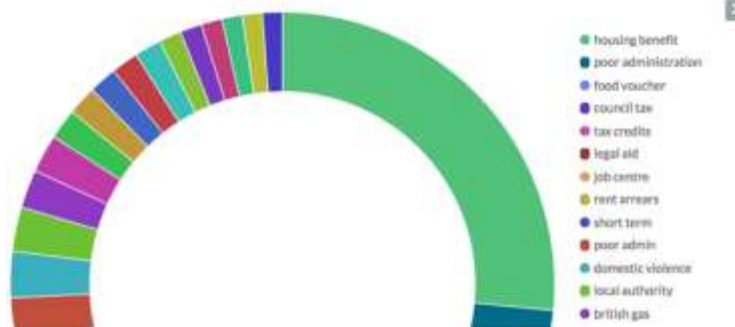
Top Topic - Unfair Dismissal - Ebefy by Location



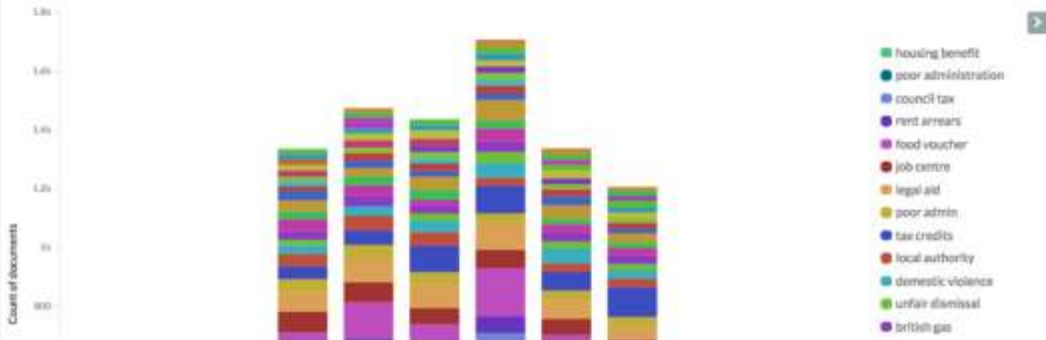
All Topics



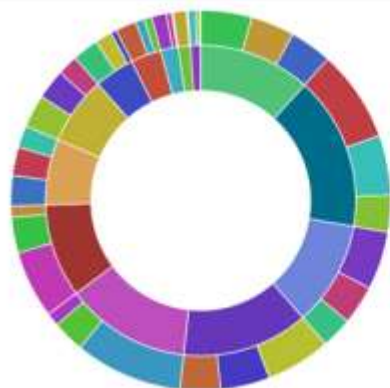
Top 25 Topics



Ebef Monthly Top 25 Topics

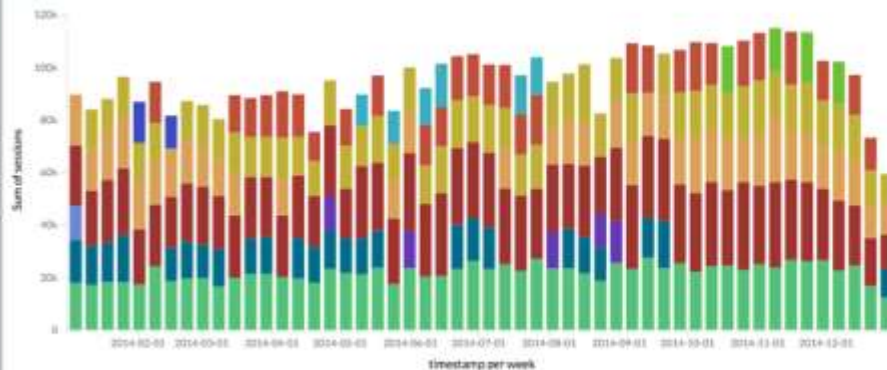


Donut of GA Sessions by AIC1 + Top 3 AIC2



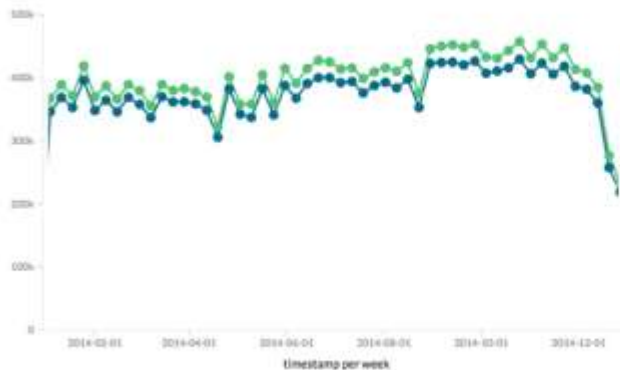
- Benefits & tax credits
- Employment
- Relationships & family
- Utilities & communications
- Tax
- Travel & transport
- Debt
- Housing
- Consumer goods & services
- Financial services & capability
- Legal
- Health & community care
- Education
- Immigration & asylum

Sessions for Top 5 AIC 2 Issues

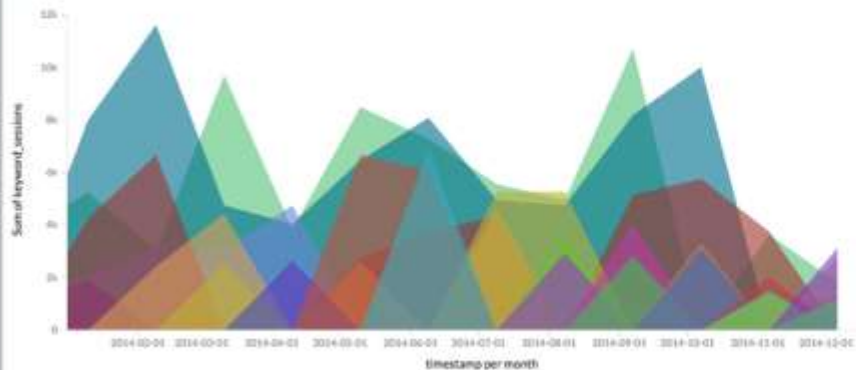


- Ty+Cs of Employment
- Divorce@ separation@ dissolution
- Marriage@ cohabitation@ civil partnership
- Internet & broadband
- TV including cable@ digital & satellite
- Other Tax Issues
- Fuel (gas@ electricity@ oil@ coal etc.)
- Driving
- Housing Benefit
- Dispute resolution
- Working+Child Tax Credits
- Personal independence payment

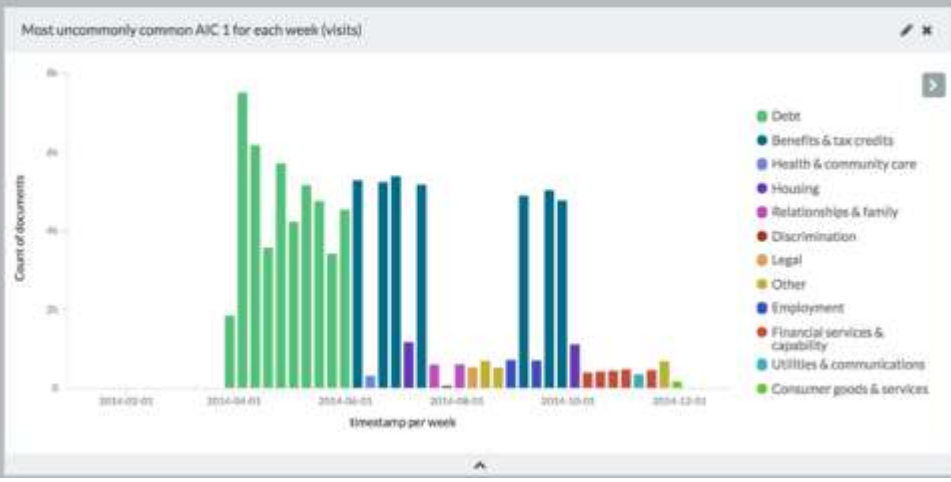
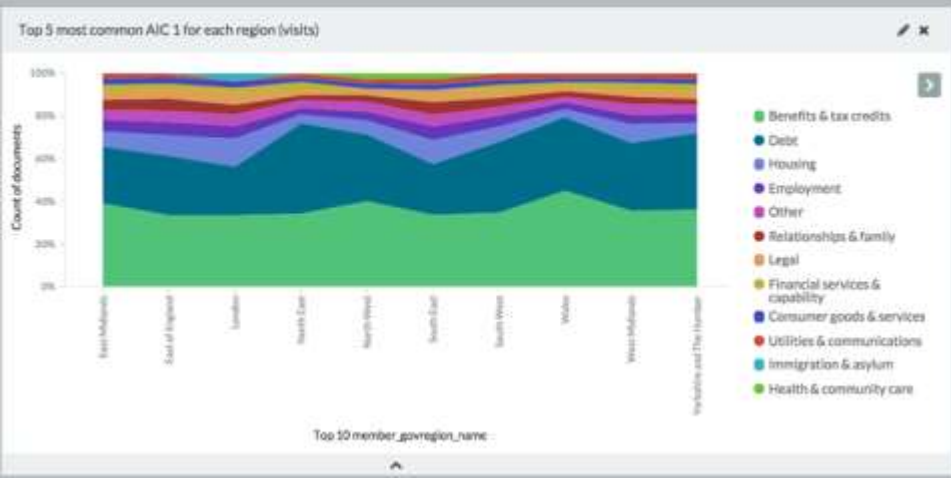
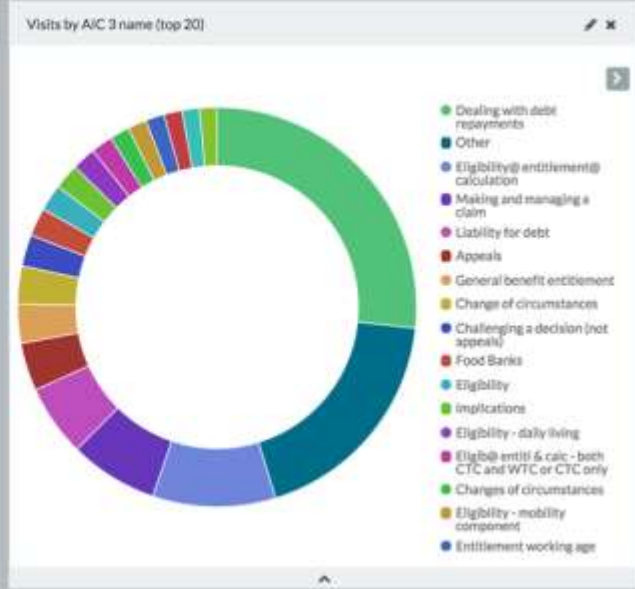
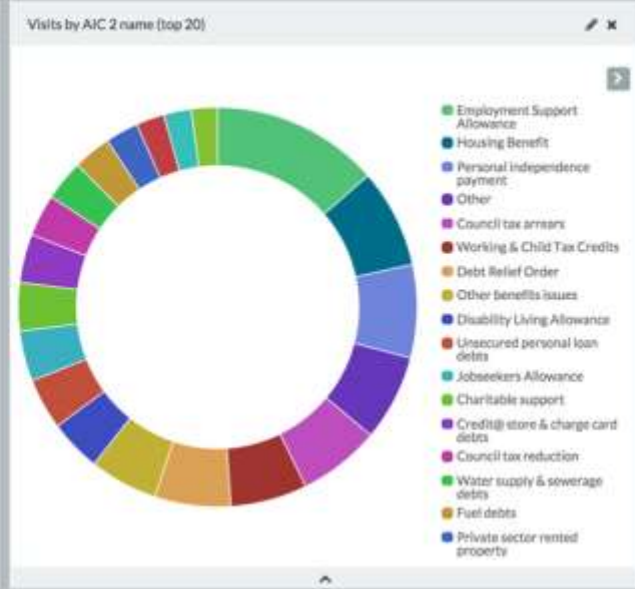
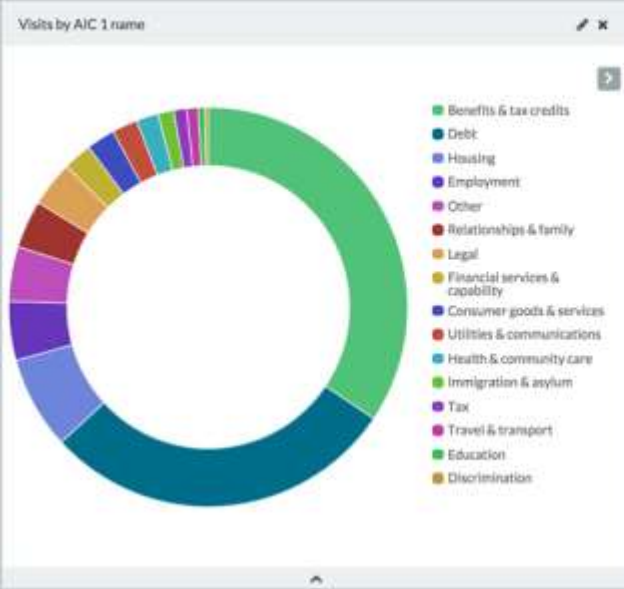
GA: Users, Sessions and New Users over time



Top 5 Google search terms resulting in visits to Adviceguide



- adviceguide
- cab advice
- citizens advice uk
- letter before action
- housing ombudsman
- advice guide
- citizens advice bureau
- adviceguide.org.uk
- avice guide
- council tax reduction 2nd home
- difference between county court and magistrate
- late email compensation
- contrived tenancy cab



The Future

Prediction Engine: needs contextual data!

- News Media
- Parliament Activity
- Office of National Statistics
- Other Charities

Implementation and Scale Out

- Integrating with CAB systems
- Production Testing

User Interface

- Lock Down the Dashboard
- Personal Sandboxes
- Custom Viz Widgets

Project Credits

Datakind:

- Emma Prest - General Manager
- Duncan Ross - Founder UK Branch

Data Ambassadors:

- Iago Martinez
- Arturo Sanchez Correa
- Peter Passaro

Volunteers:

- Henry Simms
- Billy Wong
- Sam Leach
- Emmanuel Lazardis

CAB Support:

- Laura Bunt
- Pete Watson
- Ian Ansell

About 30 additional volunteers who contributed at various stages!

Funding:

Nesta...

Advice and Support:

elasticsearch.

(Alan Hardy & Livia Froelicher)

Elasticsearch and General Data Hosting:

DATANAUTS 🚀

Google Analytics Pipelining:



The problem [SOLVED]

we can:

- ~~1. enable users to ask questions of the data~~
- ~~1. identify new emerging trends~~

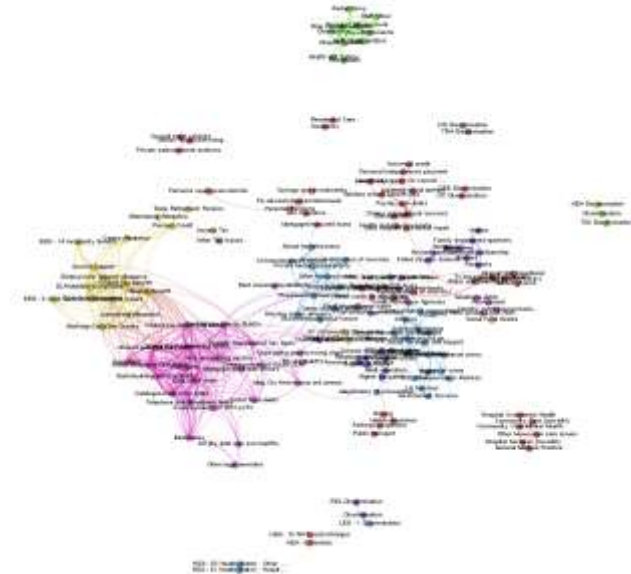
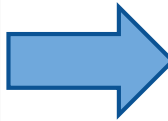
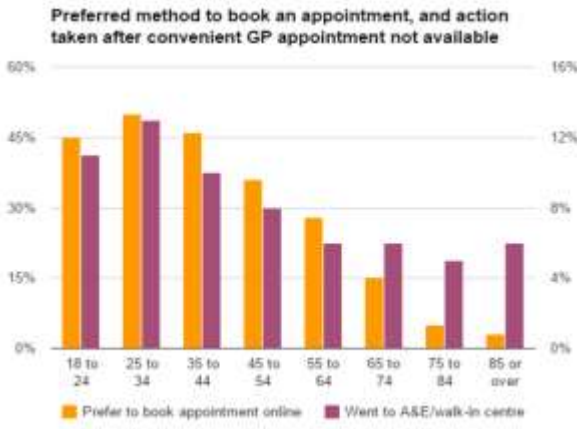
New insights already discovered

Adviceguide Consumer section hiding key details - Just how big an issue fuel and utilities are

Bi polar keeping cropping up in Befs around Debt

So much more than a dashboard

New analysis techniques learnt & new technologies introduced



Excitement about data

Kibana dashboard showcased and loved

Could be replacing core systems, watch this space

How about delivering data to bureaux

Citizens Advice is in love with data

display-screen.cab-alpha.org.uk