Using R Shiny for Cancer Surveillance: Lessons From the Trenches

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Background

- The importance of cancer statistics
- The importance of publicly available data
- The importance of easily digestible reports

Background

- Pre R shiny era
  - Pdf reports

	Vancouver		Vancouver Island		Fraser Valley		Southern Interior		Abbotsford		North		All CON Clinics	
Cancer Group	Cases	% VC Referrals	Cases	% VIC Referrals	Cases	% FVC Referrals	Cases	% CSI Referrals	Cases	% AC Referrals	Cases	% CN Referrals	Cases	% CON Clinics
Bladder	70	1.2	75	1.9	35	1.2	60	2.1	35	1.8	20	2.1	5	1.5
Body of Uterus	265	4.2	115	3.0	55	1.9	60	2.2	25	1.1	10	1.0	5	0.7
Brain and CNS	135	2.2	80	2.2	65	2.1	70	2.5	45	2.4	25	2.4	0	0.0
Breast	1335	21.3	720	19.2	705	24.6	540	19.9	390	20.3	180	19.4	125	22.8
Cervix	70	1.1	35	0.9	20	0.7	25	0.8	10	0.6	5	0.2	0	0.2
Colorectal	430	6.9	370	9.9	270	9.4	245	9.0	280	14.7	90	9.9	70	12.7
Esophagus	70	1.1	70	1.8	50	1.7	60	2.1	35	1.8	15	1.4	10	1.8
Hodgkin's Lymphoma	35	0.5	25	0.6	25	0.9	15	0.4	10	0.6	5	0.4	10	1.8
Kidney	70	1.1	45	1.2	30	1.0	30	1.0	30	1.5	15	1.6	10	1.5
Larynx	30	0.4	25	0.6	15	0.6	25	0.8	15	0.8	15	1.5	5	0.2
Leukemia	235	3.8	85	2.2	35	1.1	60	2.2	35	1.9	45	4.7	15	3.3
Lung	640	10.2	520	13.9	380	13.3	380	14.1	285	14.8	145	15.7	85	16.0
Melanoma	180	2.8	100	2.6	95	3.3	60	2.2	20	1.0	25	2.5	25	4.6
Multiple Myeloma	75	1.1	55	1.5	45	1.5	40	1.6	45	2.2	10	1.5	20	4.2
Non-Hodgkin's Lymphoma	240	3.8	200	5.3	135	4.8	135	5.0	95	4.9	60	6.5	55	9.9
Oral	190	3.0	130	3.5	95	3.4	90	3.3	75	3.9	35	4.3	0	0.2
Ovary	220	3.5	95	2.6	40	1.5	40	1.5	15	0.7	5	0.8	0	0.5
Pancreas	115	1.9	115	3.1	70	2.3	65	2.4	55	3.0	25	2.5	30	5.1
Prostate	460	7.4	435	11.7	310	10.8	370	13.5	210	10.8	100	11.1	25	4.2
Stomach	90	1.5	50	1.4	55	2.0	35	1.3	30	1.5	15	1.7	10	2.0
Testis	50	0.8	30	0.8	25	0.8	35	1.2	15	0.8	0	0.1	0	0.2
Thyroid	150	2.3	15	0.3	70	2.4	55	2.0	35	1.8	10	1.3	0	0.0
All Other Cancers*	1115	17.8	365	9.7	250	8.7	245	9.1	135	7.1	65	7.2	35	6.6
All Cancers	6265	100.0	3750	100.0	2865	100.0	2725	100.0	1925	100.0	915	100.0	545	100.0

Background

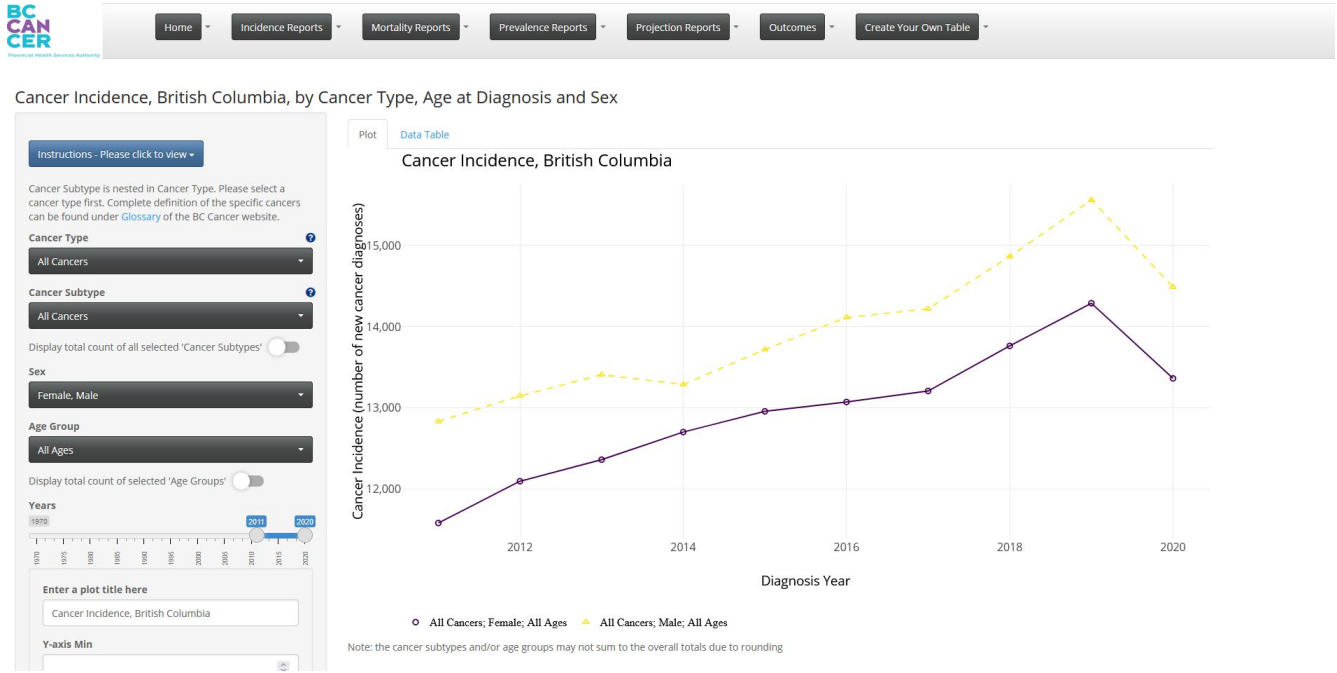
- Pre R shiny era
  - Move to RMarkdown

Why R Shiny?

- Interactivity
- User input
- Real-time data manipulation, modelling, and output

Why R Shiny?

- Multi-dimensional



The Roadmap

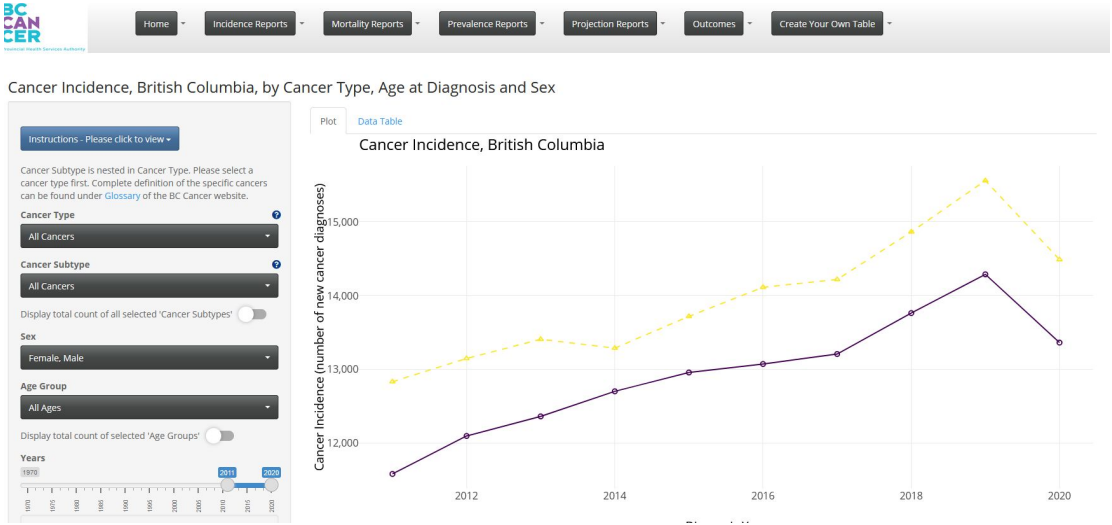

Discussions
What we want?
Candidates
- Tableau
- R Shiny
- Power BI
Winner
- R Shiny

The Challenges

- Hosting the apps on premises vs cloud
- Data privacy and confidentiality issues
- Learning curve for statisticians (to be shiny developers)

The Challenges

- Need a “website” look, not dashboard look
  - Select other reports from the same location
  - User can navigate back and forth from home to any report and any report to home
- Customized javascript and CSS



Different Approaches

- The standard approach (single code file for server and UI)
  - Easy to prototype apps
  - Easier to debug
  - Hard to version control and document
- The modular approach (Golem)
  - Develop apps as R packages
  - Easy to share and deploy
  - Same functionalities around version control and documentation as an R package

BC Cancer R Shiny Team

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Thank you!

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