Nova Scotia Health Atlas

Goal and Use Case Consultation Report

Nova Scotia Health Authority
August 16, 2019

BACKGROUND

The Dalhousie University Geo-Health Research Unit, along with the Nova Scotia Health Authority is looking to renew the *Maritime Health Atlas* currently found at healthatlas.ca.

The Health Atlas is intended to be the go-to site in Nova Scotia to access and understand health data. The tool should facilitate exploration and analysis of information, spurring research ideas and informing policy decisions across the health sector.

In its current incarnation the Atlas has a limited amount of data and requires a not-inconsiderable amount of effort to examine and retrieve that information.

This renewal seeks to gather feedback from relevant stakeholders to provide better access to information, to more efficiently incorporate relevant data for stakeholders and users, and to figure out how to best house and support the site.

Darkhorse Analytics was engaged to run a series of stakeholder meetings to understand the vision for the project, the users and use cases for the data visualization tool, and to begin a roadmap for re-development.

STAKEHOLDERS

Darkhorse hosted 4 stakeholder meetings between July 22 and July 29, 2019. The meetings included staff from

- Dalhousie University Geo-Health Research Unit
- Nova Scotia Health Authority
- Nova Scotia Department of Health and Wellness
- UPEI Centre for Health
- IWK Health Centre
- Government of Nova Scotia
- Dalhousie University, College of Pharmacy

Note that a number of other stakeholders were invited, but unable to attend including: representatives from New Brunswick, Cancer Care Nova Scotia, Cardiac Care Program, CRC Health Population, Aids Coalition Nova Scotia, MS Society.

PROJECT OBJECTIVES

When beginning an endeavor, knowing beforehand what success looks like brings clarity to how we tackle the steps required to achieve it. At a high level, consultations revealed a desire for:

- An authoritative resource for data
- Ease of use and navigation of the tool
- Ease of understanding of the data contained in the tool
- New research initiated, or more easily conducted because of access to the tool.
- Ability to make policy and resourcing decisions based on sound data

There is no simple way to measure these specific objectives, however as a proxy, increased use of the tool and time spent with the tool are good indicators that the renewal has been successful. Another possible indicator is increased reference to the tool by policymakers, media, and internally by health workers either in support of their own work or as a resource for referring others to. It will be important to develop baselines and metrics for measuring and monitoring the results of the Atlas renewal.

DATA FOCUS

Our meetings identified a set of primary data categorizations:

1. **Health determinants**
   personal, social, economic, and environmental factors that contribute to health
2. **Health behaviours**
   positive and negative behaviours and activities that impact health
   e.g. eating your veggies, smoking
3. **Health outcomes**
   e.g. incidence rates of illness or disease

Additionally a secondary data category was identified as useful:

- **Geographic Boundaries**
  Having a single, consistent source to find useful geographic boundaries related to health.

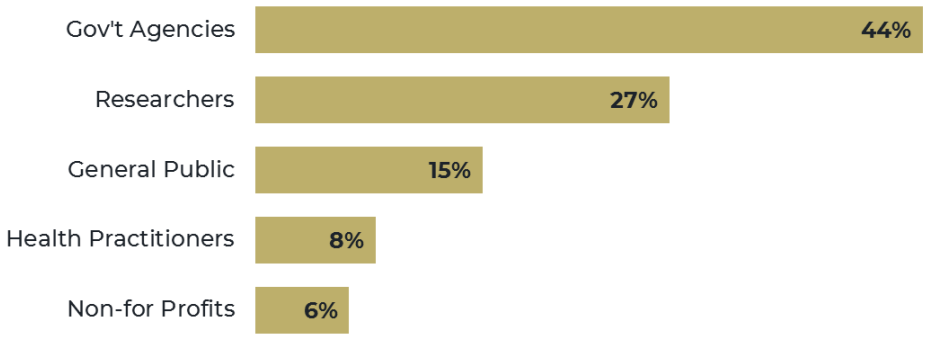
Most of the data that was discussed fall into one of these categories. There is some distinction between data related to a geographic region and data related to a specific point. For instance, the incidence rate of cancer in a Community Health Network's region vs the result of a water test at a specific location. The majority of data sets and use cases discussed focused on geographical regions.

USER GROUPS

A foundational element of effective tool development is understanding the audience. In short, who is this tool targeted at, and what are their roles and goals? Stakeholder meetings identified a number of users consolidated into these five archetypes:

1. Government agencies - e.g. NHSA, DHW, IWK
2. Researchers
3. General public
4. Health practitioners
5. Not-for-profit groups - e.g. Cancer Society, Heart & Stroke Foundation

After having identified these user archetypes we had participants perform a prioritization exercise allocating a fixed set of funding among the different archetypes. The results of that exercise show a distinct prioritization of **Government agencies** and **Researchers**.



Researchers and government agencies are seen as both information users and information providers.

While there is an overarching desire to serve all of these groups, it was recognized that an effective tool can't be all things to all people and as such when considering trade-offs and compromises in the development of the tool, keeping these two archypes at the forefront will help guide decisions.

USE CASES

Considering those prioritizations we looked to understand the main motivation of those two user groups and outline specific use cases or scenarios which the tool could have capacity to facilitate based on the brainstorming sessions with stakeholders.

Government Agencies

Motivation

To perform analysis on data to assist in health policy decision making, improve health program service delivery, and measure outcomes across a variety of health offerings.

Use Cases

- Health services delivery: staff need to understand the primary care needs of the population, the resources and programs available, gaps in service offerings and overall outcomes of services and programs.
- NHSA/DHW staff need to know where to find data. For example, ‘primary care providers need to know teen pregnancy rates by area to target in-school sexual health clinics’.
- Resource limited government professional needs a way to visualize data to support analysis. For example, ‘are there differences in patterns of access to service by social determinants of health?’
- Government analyst needs tools to understand budgets and allocations to make informed decisions on what services to adjust. For example, ‘What gaps exist in service offerings to community X vs. community Y?’
- Staff want to understand the effectiveness of programs and services on changing health outcomes to inform prioritization and service

allocation. For example, how effective are smoke-free by-laws on reducing smoking rates?
- What are the breast screening rates in Nova Scotia and how has that changed since the national guidelines went into effect?
- Identify strengths and weaknesses of various policies and determine ROI.

Researchers

Motivation

To perform data analysis to further research ideas, measure outcomes of programs and services and to use data and analysis in applying for grants/further funding for research.

Use Cases

- A student in population health is interested in understanding the relationship between social determinants of health and the outcomes
- Health services researchers need to be able to use the data to do cross provincial and national comparisons to better understand provincial capacity.
- A researcher needs to be able to obtain different variables related to environment and health at the same common geographic level to put into a regression model.
- An academic researcher wants to be able to share the results of her latest analysis with those who can use it to inform their policy making.

FUNCTIONALITY

While specific functionality should be driven by an iterative process aimed at addressing the highest prioritized scenarios mentioned above, we did explore with stakeholders some of the high level elements of functionality they believe to be important in achieving these goals.

Feedback

Context & Story

Participants want to ensure that meaning can be easily grasped when looking for or exploring data. Methods to provide context or guide the viewer through some of the data's insights (such as the stories provided in the Opportunity Atlas) or how to understand what is in the tool, and how to use it, are highly valued.

Ease of Use

Navigation with the current Health Atlas requires a lot of up front information from the user. They need to know precisely what they are looking for and what format they want it in. A renewed Health Atlas would allow for easier exploration of the data, uncovering data quickly for those who know what they want, while making it easy to explore what is available when users aren't sure exactly what they want. The site should also make the data itself easy to understand displaying it in an intuitive and easy to consume manner.

Trends & Forecasts

The existing Atlas shows a snapshot in time. There is a desire to see how things trend over time and even to display what forecasts might indicate. It is understood that data availability and prediction

confidence will be a significant factor in what can be incorporated within the tool.

Downloading

Downloading the raw data available within the tool is a key use case for many especially for researchers and analysts looking to perform more advanced analyses. But there is also a desire to be able to download visuals from the tool, such as the maps and charts it provides to use in reporting and presentation.

Consistent Data

Participants identified the need for consistent & solid foundational data. Data in a consistent format and structure, as well as in consistent geographical aggregations where possible. These efforts can assist in linking data for research and in understanding what is available.

Adding Data & Context

It would be useful to have a process whereby data could not only be updated but new datasets could be integrated easily by those managing the tool so it could be an ever-growing warehouse of useful and relevant health data. In addition the capacity to add context and story to this new data as noted above would be quite valuable.

Depth and Breadth of Data

There is a desire for the tool to house a multitude of data sets from a variety of sources, including the focus areas of health determinants, health behaviours and health outcomes, but also other data that would further analysis.

One of the key points that came up in almost every session was the mention of the decommissioned *Nova Scotia Community Counts*. It

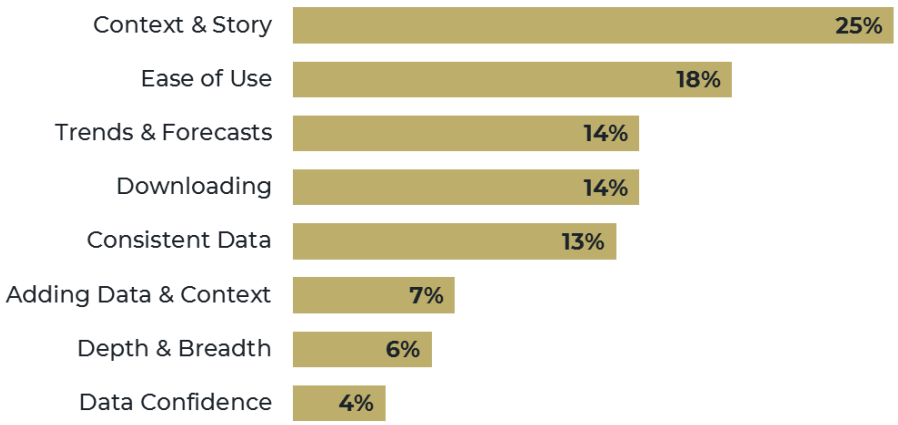
was clear this was a resource valued by many and would be a boon for the renewed atlas to replace some of what was lost.

In addition, the deprivation indices developed by Dr. Terashima were also brought up multiple times and easy access to them would be highly valued by the stakeholders.

Data Confidence

Ideally the tool is able to convey, the data's source and recency with clarity but also address the confidence or error that may exist in the data in a manner that is not reductive.

Again an exercise was conducted to determine how participants would prioritize these elements with an understanding that resources are limited. The allocation results prioritized the following:



Some of these objectives are congruent with each other (e.g. Context & Ease of Use) and with the use case from above, while others are less so (e.g. Data Confidence/Error and Ease of Use). Effectively combining these desires into a coherent tool will require some compromise.

Recommendation

There can be a tendency to define functionality that tries to accommodate everyone's needs. Unfortunately this often results in a tool that works well for no one. While our discussion did bring up some conflicting priorities, the participants generally agreed that having a focused tool that does a great job at meeting specific needs is a better approach than attempting to build something targeted at everyone. Starting with a smaller scope focused on available datasets will create an effective foundation for the renewed Health Atlas to continue building off of.

RISKS & CONCERNS

Governance

A key issue discussed in the meetings was governance. Who will own the Health Atlas? Who will be responsible for ensuring the data is correct and up to date? Who will update the data? Where will the site and data be housed? What is the process for getting data on the site?

With so many stakeholders involved in the process, these can be difficult questions to tackle while maintaining buy-in from all involved. Defining the champion and owner as well as developing a process that works for at least a few of the key stakeholders will be necessary for this project's success.

Geographic Definitions

Geographies were a key point of discussion in every meeting. Some noted that the Health Atlas was an excellent resource for retrieving geographic boundaries. There were also concerns, however, around the availability of data at different levels of aggregation and the usefulness/relevancy of certain aggregations for different datasets. It will be necessary to determine if consistent boundaries are required for every dataset, or if some are only available in one format and how that should be organized to aid analysis and prevent confusion.

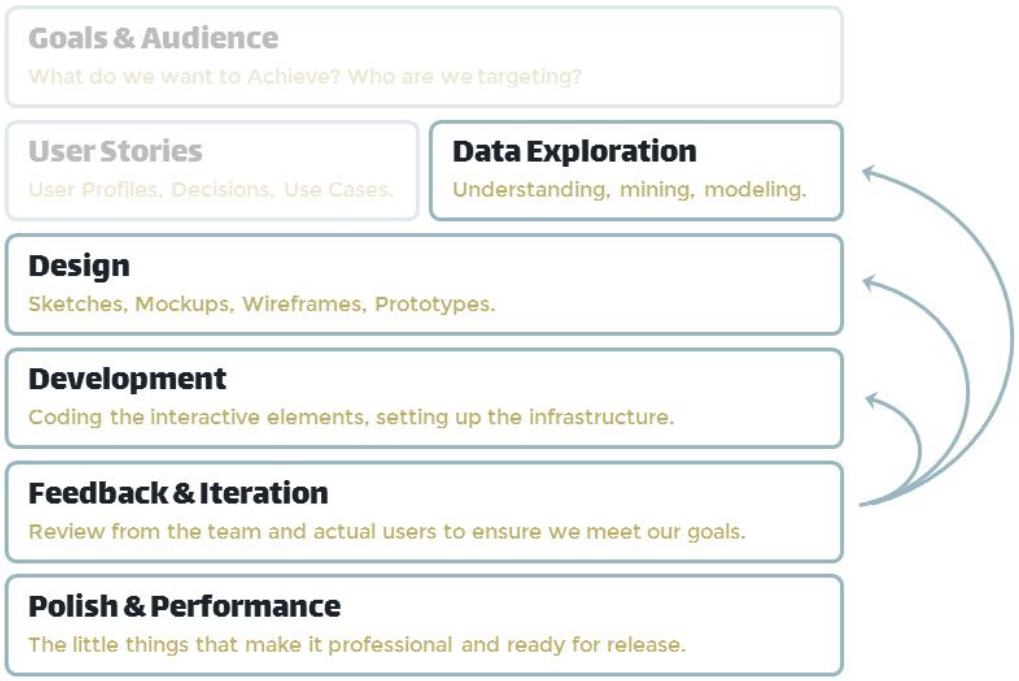
In addition to this there was contention about some of the boundaries and their relevance to certain groups. While it is admittedly an impossible task to create a set of boundaries that is perfect for all people, we do believe these concerns may be mitigated by allowing users to overlay their own boundaries on top of the data, providing a view of existing data in the context of their own geographies.

Responsible Data Presentation

A key concern with such tools is to ensure that the data resource doesn't encourage incorrect conclusions. As was mentioned above conveying sample error or confidence intervals can add to a tool's complexity but be an important factor in accurate representation of the data. Additionally, analytic functionality can sometimes result in spurious suppositions when performed by inexperienced or uneducated users. Care must be taken to find the right balance in these situations.

HEALTH ATLAS ROADMAP

Darkhorse has delivered numerous visualization projects and our tried and tested visualization process is outlined below. We believe that our methodology represents the best practice in visualization design and development. The remaining sections of this document are written from the Darkhorse's perspective on development and delivery, but we believe the same process would benefit any effort to deliver an effective Health Atlas.



For the Health Atlas renewal, this report has outlined and prioritized the goals and audience, and a set of user stories have been formulated. The next steps include:

Data Exploration and Design Ideation

The next step for the development of the Health Atlas will be exploration of the available data. In collaboration with the project leads,

it will be important to look for interesting or compelling trends and decide on which metrics will best support the desired outcome.

Then, sketch possible interfaces for exploring the data, introducing the data, as well as methods for visualizing its different facets. Following sketching, create a rough mock-up of how the tool might work and which features are “must-have”.

Design Refinement and Development

Once a rough mock-up of the tool has been created, begin developing the core functionality by exploring the technical space to ensure the data volume and intended interactions can be accommodated while maintaining a snappy, responsive experience for the user.

Testing, Iteration, and Polish

Once a minimum level of functionality has been developed, begin gathering feedback from potential users. This will ideally include focus groups or working sessions and will require coordination with the stakeholder team. It may also help to make presentations to wider stakeholders to garner additional feedback.

The aim is to demonstrate to potential users how it works and then see what questions or problems it invites, and how easily they understand the concepts and data it introduces. This feedback will help to further refine the functionality and visuals, ensure the tool works bug free, and provide a professional, polished experience. The danger in this phase is in overbuilding the feature set to the point that it confuses users. Frequent user testing and focus groups can minimize this risk.

Launch

Once a final set of features has been established, determine a launch date and execute the launch plan. Evaluate the usage of the tool and ensure that there are no problems with uptime and functionality.