



Introduction to EvalC3 Online

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Hallam
University**



Programme

09.30	Welcome & introductions	
	Objectives & Expectations	
09.45	Where EvalC3 can be useful	
10.00	Data Preparation	
10.20	Break	
10.30	Explore Select Data & Design Pages	
11.10	Break	
11:20	Search Algorithms & Decision Trees	
12.20	Feedback	
12.30	End	

Objectives

1. Understanding of when and where EvalC3 can be useful
2. Ability to navigate the SHU and EvalC3 website
3. Understanding of sequence of the EvalC3 workflow
4. Understanding of requirements and choices available at each stage of the workflow
5. Hands on experiences with the analyses at each stage
6. Identification of potential future uses in their workplace

Uses: Evaluation

A checklist of types of evaluation questions that can be asked

EvalC3



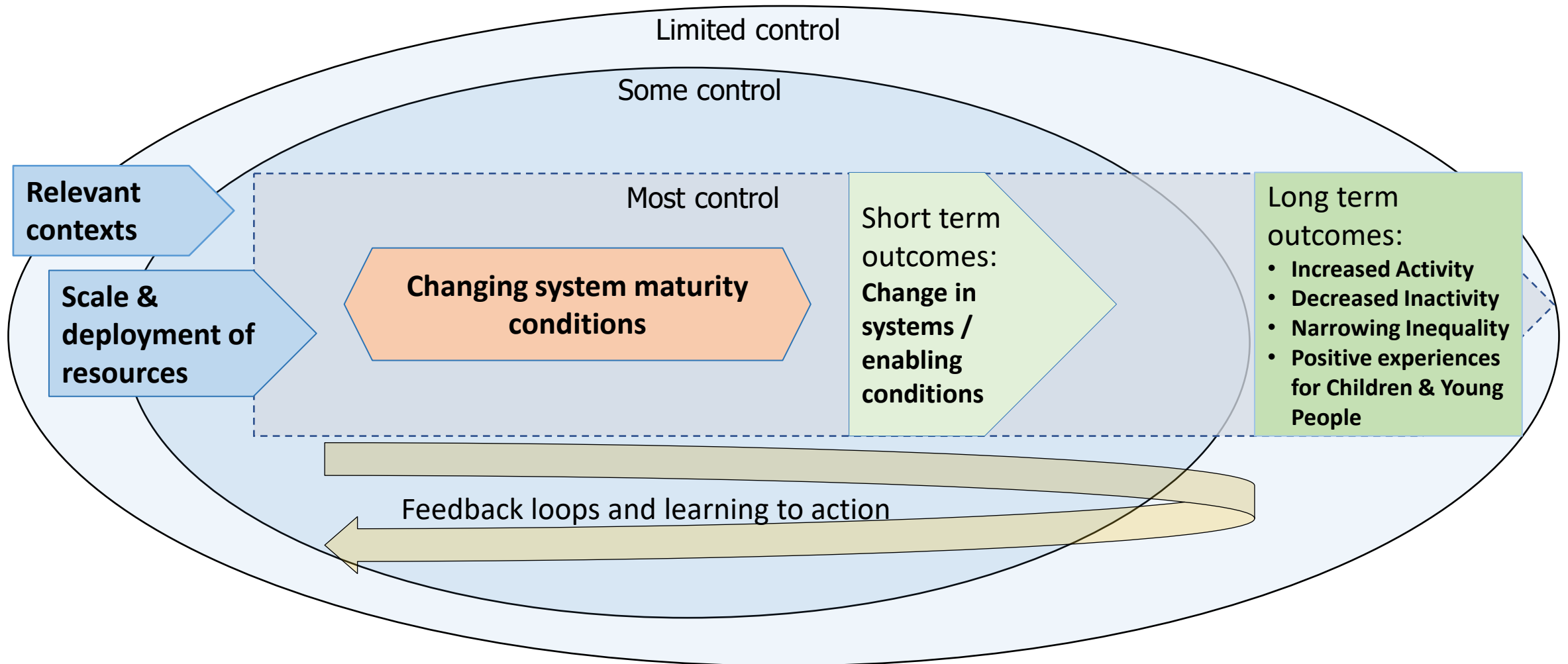
```
graph LR; EvalC3[EvalC3] --> 1[1. Descriptive]; EvalC3 --> 2[2. Valuative]; EvalC3 --> 3[3. Explanatory]; EvalC3 --> 4[4. Predictive]; EvalC3 --> 5[5. Prescriptive];
```

1: Question types	Description
1. Descriptive	about what happened , when, where when, who. Without this information other questions below can be difficult to answer
2. Valuative	about peoples' assessments of the value and significance of what happened. (aka Normative? , which will then inform choices about where to investigate...
3. Explanatory	about the causes of what happened or what happened as a result of a cause
4. Predictive	about likely consequences of what happened
5. Prescriptive	about what what could or should be done about what happened, or what is expected to happen

Uses: How we can describe the world

- The causes of an effect
 - Which of these causes was associated with an effect of interest?
- The effects of a cause
 - Which of these events were associated with a cause of interest?
- Combinations of causes, not just single causes
 - A&B caused C, but A or B alone did not
- Multiple combinations of causes, each of which will work
 - A&B causes C and D&E causes C
- Asymmetric causes
 - A&B causes C but the absence of A&B does not necessarily mean C does not happen

NELP Theory of Change in complex systems



Data preparation - Dichotomisation

- EvalC3 works with binary data, where each case is assessed for **membership in a set** (fully in = 1, fully out = 0),
- Reduces diverse qualitative or quantitative attributes into binary categories, enabling case comparison.
- Cut-off points are identified where a condition becomes theoretically meaningful to an outcome.

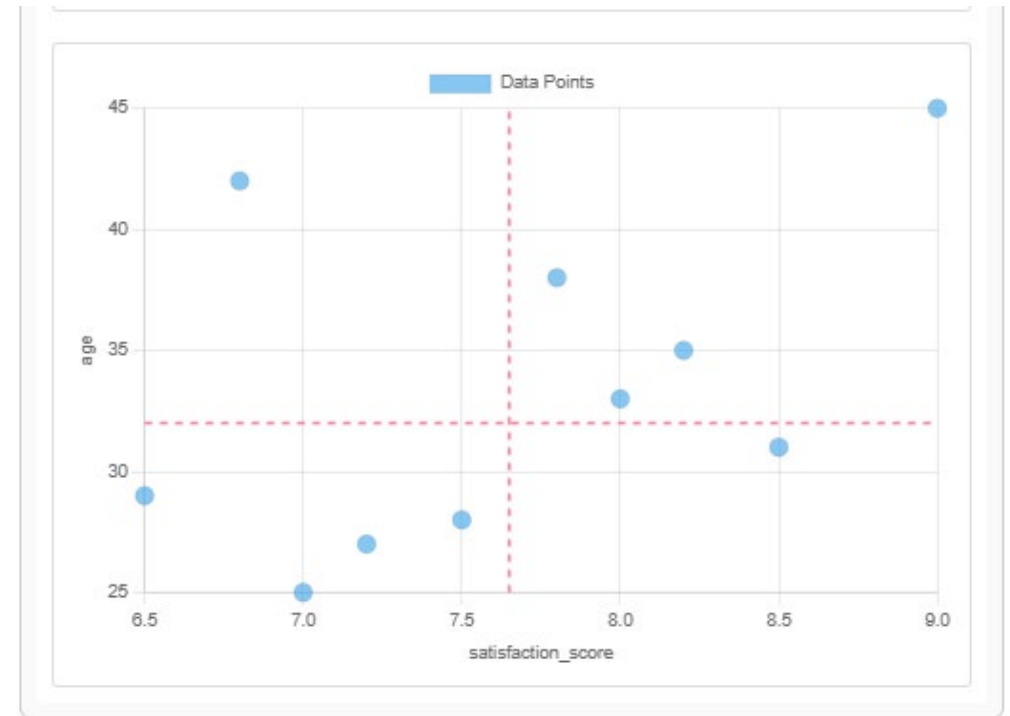
Data preparation - Dichotomisation

Sometimes a binary classification may be more informative than a numerical correlation

The overall correlation here is weak (0.46)

But these manually identified cut-offs identify a good predictive model (80% accuracy), where...

- If the average rating of "life satisfaction" is above 7.5 then the average age of the respondents is likely to be above 32 years

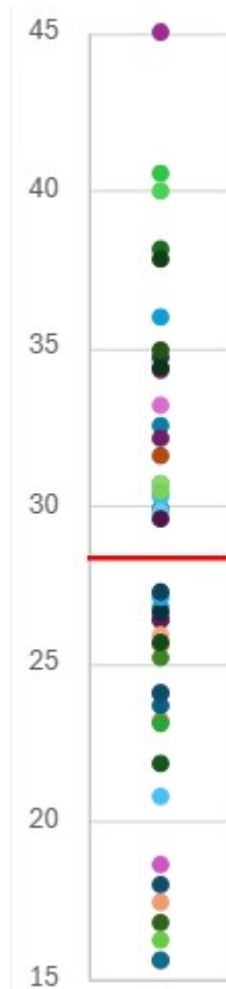


Data preparation - Quantitative

Collect raw data

ID	Deprivation Score
Case 1	29.9
Case 2	23.2
Case 3	38.1
Case 4	36
Case 5	45
Case 6	30.7
Case 7	34.7
Case 8	26.4
Case 9	37.8
Case 10	23.7
Case 11	26.4
Case 12	16.8
Case 13	26.8
Case 14	25.6
Case 15	23.1

Identify cut-off



Assign binary value

=IF(A02>28, 1, 0)	
AO	AP
Deprivation Score	
29.9	1
23.2	0
38.1	1
36	1
45	1
30.7	1
34.7	1
26.4	0
37.8	1
23.7	0
26.4	0

Data preparation - Categorical

Collect raw data

Identify cut-off

Assign binary value

ID	Funding Type
Case 1	Place expansion
Case 2	LDP
Case 3	LDP
Case 4	LDP
Case 5	Place expansion
Case 6	LDP
Case 7	LDP
Case 8	Transition
Case 9	LDP
Case 10	LDP
Case 11	LDP
Case 12	LDP
Case 13	Transition
Case 14	Transition
Case 15	Place expansion

LDP
or
Non - LDP

Binary
0
1
1
1
0
1
1
0
1
1
1
1
0
0
0

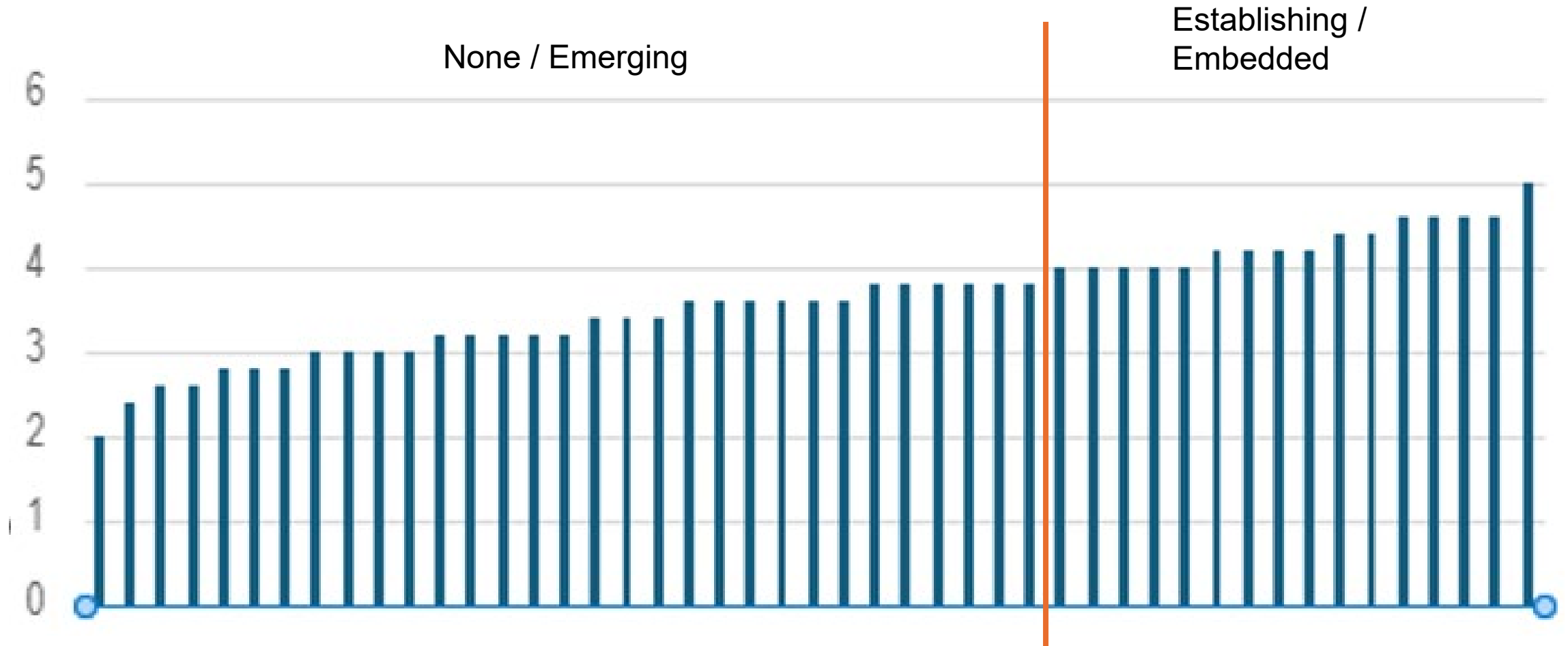
Data preparation - Qualitative

Collect raw data

	<i>No change</i>	<i>Emerging in practice</i>		<i>Establishing in practice</i>		<i>Embedded in practice</i>	
	1	2	3	4	5	6	7
Strengthening community & individual capacities	Thriving community sector that works together on physical activity						
	<p>Limited attention is given to physical activity as part of usual work for Voluntary Community Faith and Social Enterprise (VCFSE) organisations in the place.</p> <p>VCFSE organisations are precarious (i.e. live 'hand to mouth') and/or competitive which inhibits collaboration.</p>	<p>Some VCFSE organisations recognise how PA can align with their aims and are willing to work with others to incorporate physical activity into their work and widen reach to those who may be inactive.</p> <p>These efforts tend to be time limited and/or are bound to external funding. (i.e. Efforts to incorporate physical activity is intermittent / sporadic).</p>	<p>Many VCFSE organisations recognise how PA can align with their aims. They are supported and willing to work with others to incorporate physical activity into their work and widen reach to those who may be inactive.</p> <p>Physical activity is becoming part of usual practice for some VCSFE organisations as a way of contributing to their core objectives.</p>	<p>A network of VCFSE organisations are working together, with a common purpose, and with other place-based agencies to build physical activity into usual work, widen reach to those underserved and pool resources.</p> <p>For example, faith-based organisations work with community development charities and local sports clubs to encourage young people to maintain their education.</p>			

Data preparation - Qualitative

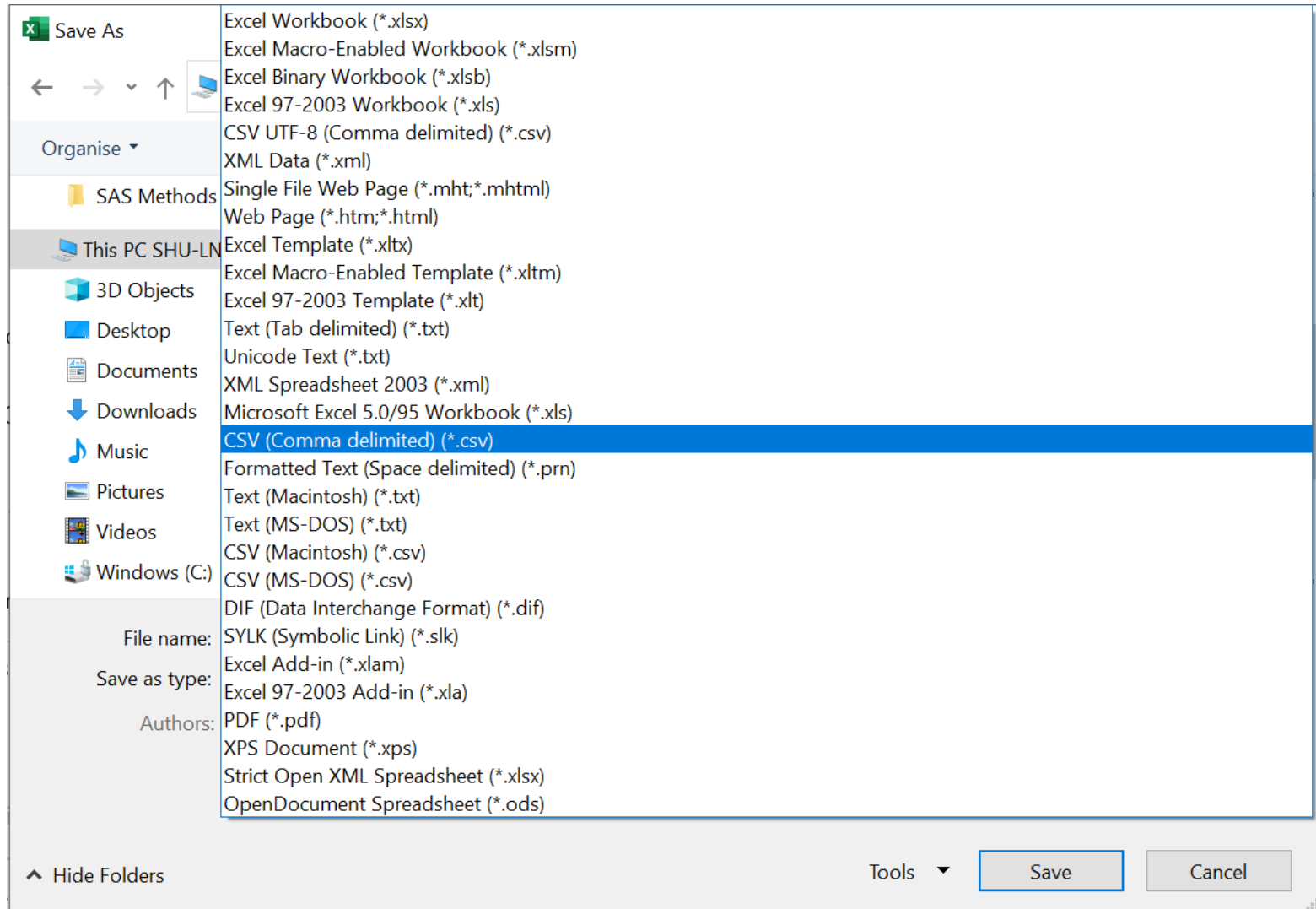
Identify cut-off



Data preparation - Example

	A	B	C	D	E	F
1	ID	Population Density	% Population from ethnic minorities	Median Age	Deprivation score	Inactivity
2	Place 1	0	0	1	1	1
3	Place 2	0	0	1	0	1
4	Place 3	0	1	0	1	1
5	Place 4	0	0	1	0	0
6	Place 5	0	0	1	1	0
7	Place 6	0	0	1	0	0
8	Place 7	0	0	1	1	1
9	Place 8	1	1	0	1	1
10	Place 9	0	0	1	1	1
11	Place 10	1	0	1	1	1
12	Place 11	0	0	0	0	0
13	Place 12	0	0	1	0	0
14	Place 13	1	1	0	1	0
15	Place 14	0	0	1	0	0
16	Place 15	0	0	0	1	0
17	Place 16	1	1	0	1	1
18	Place 17	1	1	0	1	1

Data preparation - Example

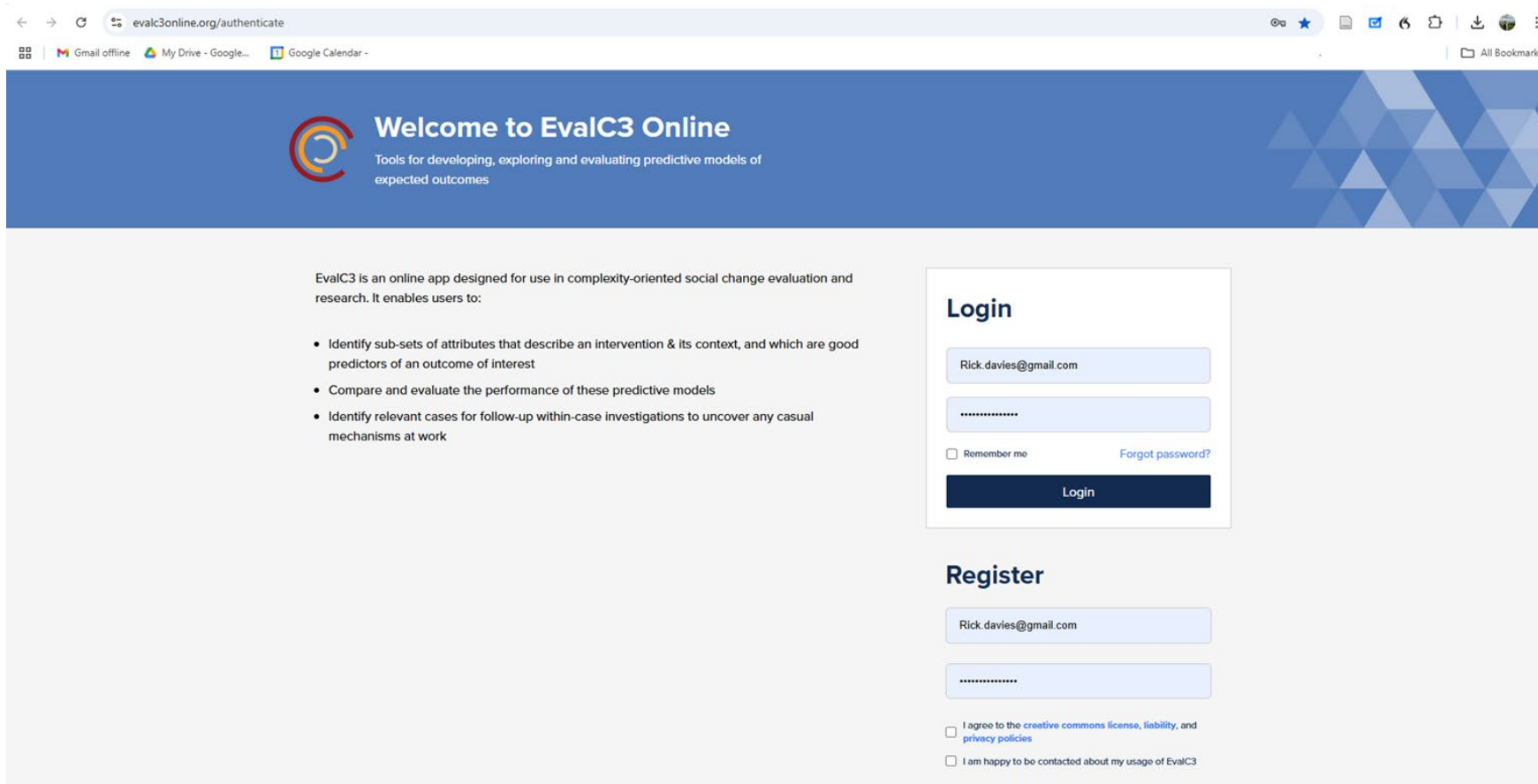


Example Files

<https://tinyurl.com/4fsrfj4x>

Navigation 1: Where to start


<https://evalc3online.org/>



The screenshot shows the EvalC3 Online website. The header is a blue banner with the EvalC3 logo (a stylized 'C' with a red and orange gradient) and the text "Welcome to EvalC3 Online" and "Tools for developing, exploring and evaluating predictive models of expected outcomes". Below the header, the main content area is light gray. On the left, there is a paragraph describing EvalC3 and a bulleted list of its features. On the right, there are two forms: "Login" and "Register". The "Login" form has fields for email (Rick.davies@gmail.com) and password (masked with dots), a "Remember me" checkbox, a "Forgot password?" link, and a "Login" button. The "Register" form has fields for email (Rick.davies@gmail.com) and password (masked with dots), and two checkboxes for agreeing to the license and privacy policies, and for being contacted about usage.

evalc3online.org/authenticate

Gmail offline My Drive - Google... Google Calendar - All Bookmarks

 **Welcome to EvalC3 Online**
Tools for developing, exploring and evaluating predictive models of expected outcomes

EvalC3 is an online app designed for use in complexity-oriented social change evaluation and research. It enables users to:

- Identify sub-sets of attributes that describe an intervention & its context, and which are good predictors of an outcome of interest
- Compare and evaluate the performance of these predictive models
- Identify relevant cases for follow-up within-case investigations to uncover any casual mechanisms at work

Login

Rick.davies@gmail.com

.....

☐ Remember me [Forgot password?](#)

Login

Register

Rick.davies@gmail.com

.....

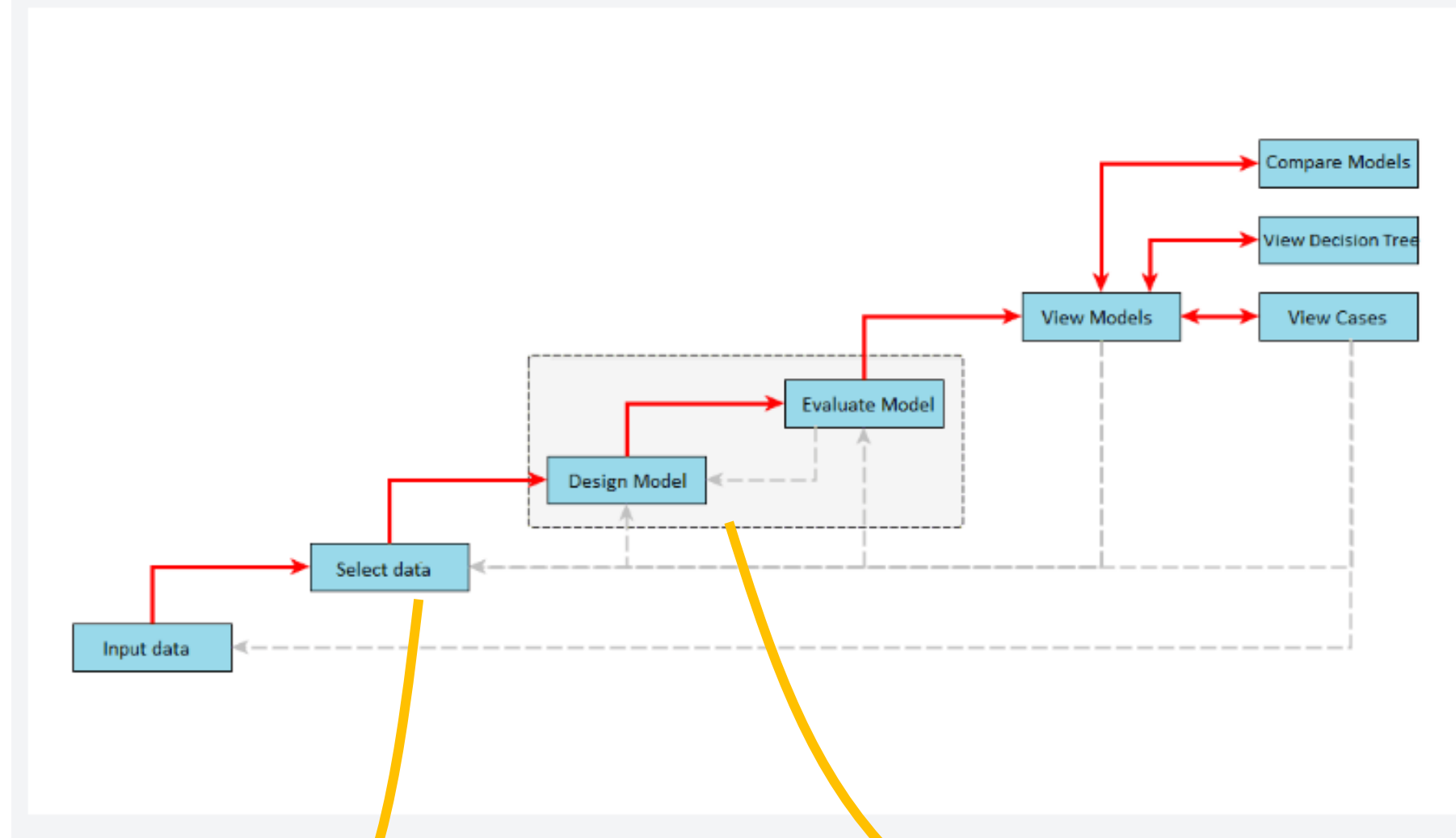
☐ I agree to the [creative commons license](#), [liability](#), and [privacy policies](#)

☐ I am happy to be contacted about my usage of EvalC3

Navigation 2: The Flow Chart

Overview

Within page view



Navigation 3: Sources of help

Whole page
help

Item help

Site
help

EvalC3 Online

[How to use](#) [About EvalC3 Online](#) [Sign Out](#)

Select Data [Learn more about how to view data](#)

[Find Optimal Attributes](#)

[Sort By Configuration](#)

[Design & Evaluate](#)

[Start Again](#)

Configurations: 14 [i](#)

Consistency: 100.00% [i](#)

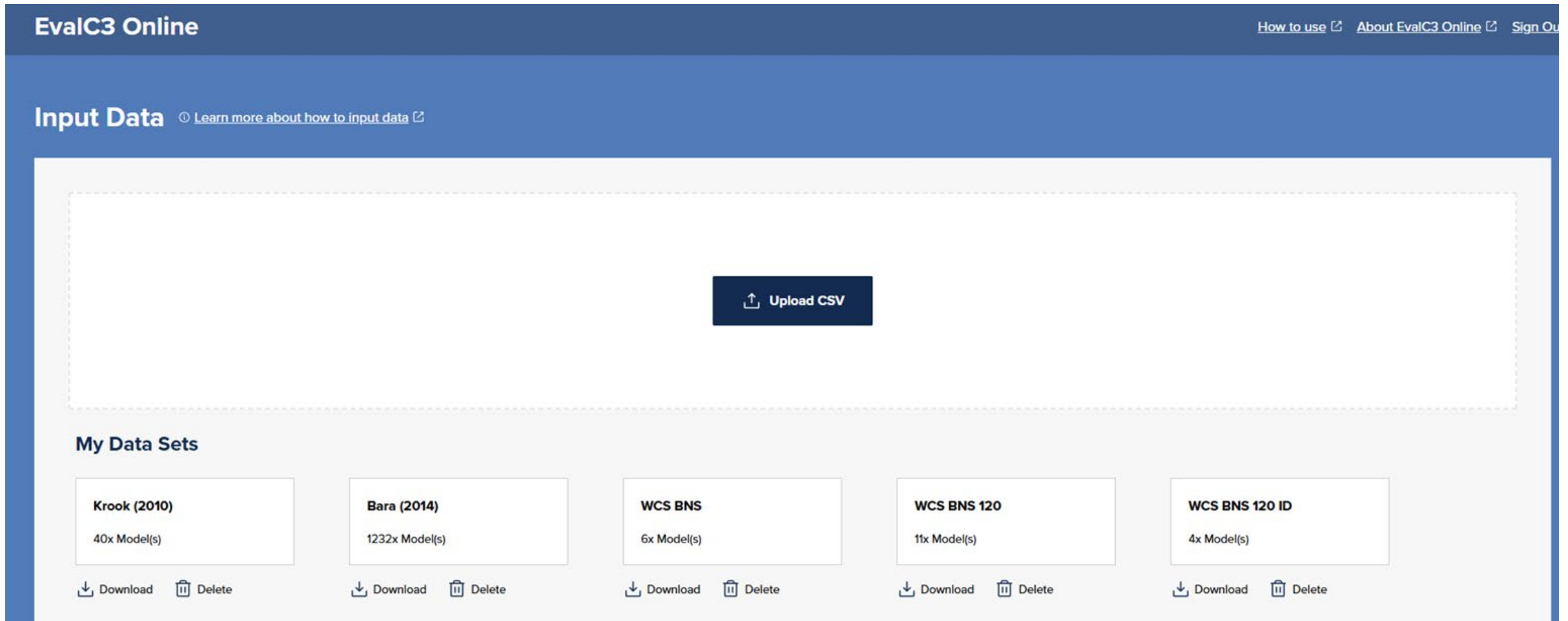
Diversity: 43.75% [i](#)

Balance: 34.62% [i](#)

Missing Data: 0.00% [i](#)

Input Data screen

- Download and examine the CSV file format
- Load the Example data
- Visit the Help page



The screenshot shows the 'Input Data' screen of the EvalC3 Online platform. The page has a dark blue header with the 'EvalC3 Online' logo on the left and links for 'How to use', 'About EvalC3 Online', and 'Sign Out' on the right. Below the header, the 'Input Data' section is highlighted in a lighter blue bar, with a link to 'Learn more about how to input data'. The main content area is white and features a large dashed rectangular box in the center, containing a dark blue button with an upload icon and the text 'Upload CSV'. Below this box, the 'My Data Sets' section displays five data sets in a row. Each data set is represented by a white box with a title, a description of the number of models, and 'Download' and 'Delete' buttons at the bottom.

Data Set Name	Model Count	Download	Delete
Krook (2010)	40x Model(s)	Yes	Yes
Bara (2014)	1232x Model(s)	Yes	Yes
WCS BNS	6x Model(s)	Yes	Yes
WCS BNS 120	11x Model(s)	Yes	Yes
WCS BNS 120 ID	4x Model(s)	Yes	Yes

Select Data screen

- Change the status of case attributes
- Save these settings
- Sort configurations
- Click on Design & Evaluate

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Select Data

[Learn more about how to view data](#) [Find Optimal Attributes](#) [Sort By Configuration](#) [Design & Evaluate](#) [Start Again](#)

Configurations: 14 [i](#) Consistency: 100.00% [i](#) Diversity: 43.75% [i](#) Balance: 34.62% [i](#) Missing Data: 0.00% [i](#)

[Save settings](#) [Default](#)

IGNORE	ID	ATTRIBUTE	ATTRIBUTE	ATTRIBUTE	ATTRIBUTE	ATTRIBUTE	OUTCOME
	COUNTRY	ELECTORAL SYSTEM	QUOTAS	WOMEN'S STATUS	LEVEL OF HUMAN DEVELOPMENT	POST-CONFLICT SITUATION	% WOMEN IN NATIONAL PARLIAMENT
<input type="checkbox"/>	Benin	1	0	0	1	0	0
<input type="checkbox"/>	Botswana	0	1	1	1	0	0
<input type="checkbox"/>	Burkina faso	1	0	0	0	1	0
<input type="checkbox"/>	Burundi	1	1	0	0	1	1
<input type="checkbox"/>	Congo	0	0	0	1	1	0

Design & Evaluate

- Vary the Design settings
- Watch the Evaluation measures
- Search for information

EvalC3 Online

How to use [About EvalC3 Online](#) [Sign Out](#)

Design & Evaluate [Learn more about how to design & evaluate](#)

View Models

← Back ↻ Start Again

Model Design ①

Outcome

THIS OUTCOME	WILL BE	SWITCH
% women in national parliament	Present	<input checked="" type="checkbox"/>

Attributes

Reset

ATTRIBUTE	STATUS	SWITCH
Electoral system	n/a	<input type="checkbox"/> <input checked="" type="checkbox"/>
Quotas	n/a	<input type="checkbox"/> <input checked="" type="checkbox"/>
Women's status	n/a	<input type="checkbox"/> <input checked="" type="checkbox"/>
Level of human development	n/a	<input type="checkbox"/> <input checked="" type="checkbox"/>
Post-conflict situation	n/a	<input type="checkbox"/> <input checked="" type="checkbox"/>

Save Model ①

Model Evaluation ①

Confusion Matrix

TOTAL CASES: 26	DATA SAYS OUTCOME IS...			CASES
	PRESENT	ABSENT		
MODEL ATTRIBUTES ARE...	PRESENT	TP = 0	FP = 0	0%
	ABSENT	FN = 9	TN = 17	100%
CASES		35%	65%	100%

Model Status

THE CURRENT SET OF ATTRIBUTES IS:

Not Necessary ①

Not Sufficient ①

For the outcome to be:

Present

Model Performance

How to use [How to use](#)

TYPE	MEASURE	VALUE (%)
OVERALL	Accuracy ①	-
	Balanced accuracy ①	-
	F1 score ①	-
	Matthews Coefficient ①	-
SPECIFIC	Coverage / Sensitivity / Recall ①	-
	Consistency / Precision ①	-
RELATIVE	Lift ①	-

Search for New Models

[Learn more about how to search for new models](#)

Find the configuration of attributes that best predicts the presence/absence of the outcome according to a selected performance indicator.

Search type

- Exhaustive search of all configurations ①
- Evolutionary search for best configuration ①
- Incremental search, for one additional attribute ①
- Build a decision tree with a maximum depth ①

Optimize

Accuracy

▼

Number of attributes

5

▼

Find models that are

Models status

- Most predictive of any kind ①
- Necessary and Sufficient ①
- Necessary but not Sufficient ①
- Sufficient but not Necessary ①

Find

Break

Search algorithms

- Try the exhaustive search, using existing settings

Search for New Models

[Learn more about how to search for new models](#)

Find the configuration of attributes that best predicts the presence/absence of the outcome according to a selected performance indicator.

Search type

- ☐ Exhaustive search of all configurations
- ☒ Evolutionary search for best configuration
- ☐ Incremental search, for one additional attribute
- ☐ Build a decision tree with a maximum depth

Optimise
Accuracy

Number of attributes
5

Find models that are

Models status

- ☒ Most predictive of any kind
- ☐ Necessary and Sufficient
- ☐ Necessary but not Sufficient
- ☐ Sufficient but not Necessary

Find

View Models

- Vary selections &
- Observe effect on next options

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View Models [Learn more about viewing models](#)

Evaluate

View Cases

View Decision Tree

Compare Models

[← Back](#) [↻ Start Again](#)

Delete model(s)

SELECT ALL <input type="checkbox"/>	NAME	TIMESTAMP	TYPE	SETTINGS	OBJECTIVE	TARGET OUTCOME	ACCURACY	BALANCED ACCURACY	F1 SCORE	MATTHEWS COEFFICIENT	COVERAGE	CONSISTENCY	LIFT	COUNTRY	ELECTORAL SYSTEM
<input type="checkbox"/>	Decision Tree (Present, Accuracy) ✎	07/02/2025, 09:47:32	Decision Tree	Default	Accuracy	Present	81%	83%	76%	62%	89%	67%	193%	ID	n/a
<input type="checkbox"/>	Rick 07022025 ✎	07/02/2025, 09:47:18	User generated	Default		Present	88%	83%	80%	75%	67%	100%	289%	ID	n/a
<input type="checkbox"/>	quotas and post conflict ✎	09/01/2025, 11:17:08	User generated	Default		Present	88%	83%	80%	75%	67%	100%	289%	ID	n/a
<input type="checkbox"/>	Decision Tree (Present, Accuracy) ✎	09/01/2025, 11:16:27	Decision Tree	Default	Accuracy	Present	81%	83%	76%	62%	89%	67%	193%	ID	n/a

View cases

- Explore Select function

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View Cases [Learn more about viewing cases](#)

Model Name: Decision Tree (Present, Accuracy)

[← Back](#) [↺ Start Again](#)

Key True Positive True Negative False Positive False Negative Most Similar (MS) Most Different (MD) Selected Case

SELECT	CASES	MS & MD	STATUS ↑↓	SIMILARITY	ELECTORAL SYSTEM	QUOTAS	WOMEN'S STATUS	LEVEL OF HUMAN DEVELOPMENT	POST-CONFLICT SITUATION	OUTCOME
<input type="checkbox"/>	Burundi	100%	TP	65%	1	1	0	0	1	1
<input type="checkbox"/>	Ethiopia	100%	TP	65%	0	1	0	0	1	1
<input type="checkbox"/>	Mozambique	100%	TP	65%	1	1	0	0	1	1
<input type="checkbox"/>	Namibia	100%	TP	65%	1	1	1	1	1	1
<input type="checkbox"/>	Senegal	100%	TP	60%	0	1	0	1	0	1
<input type="checkbox"/>	South Africa	100%	TP	65%	1	1	1	1	1	1
<input type="checkbox"/>	Tanzania	100%	TP	60%	0	1	0	1	0	1
<input type="checkbox"/>	Uganda	100%	TP	65%	0	1	1	1	1	1
<input type="checkbox"/>	Benin	100%	TN	72%	1	0	0	1	0	0

Decision Tree models

- Can you get here?
- Describe a single configuration

EvalC3 Online

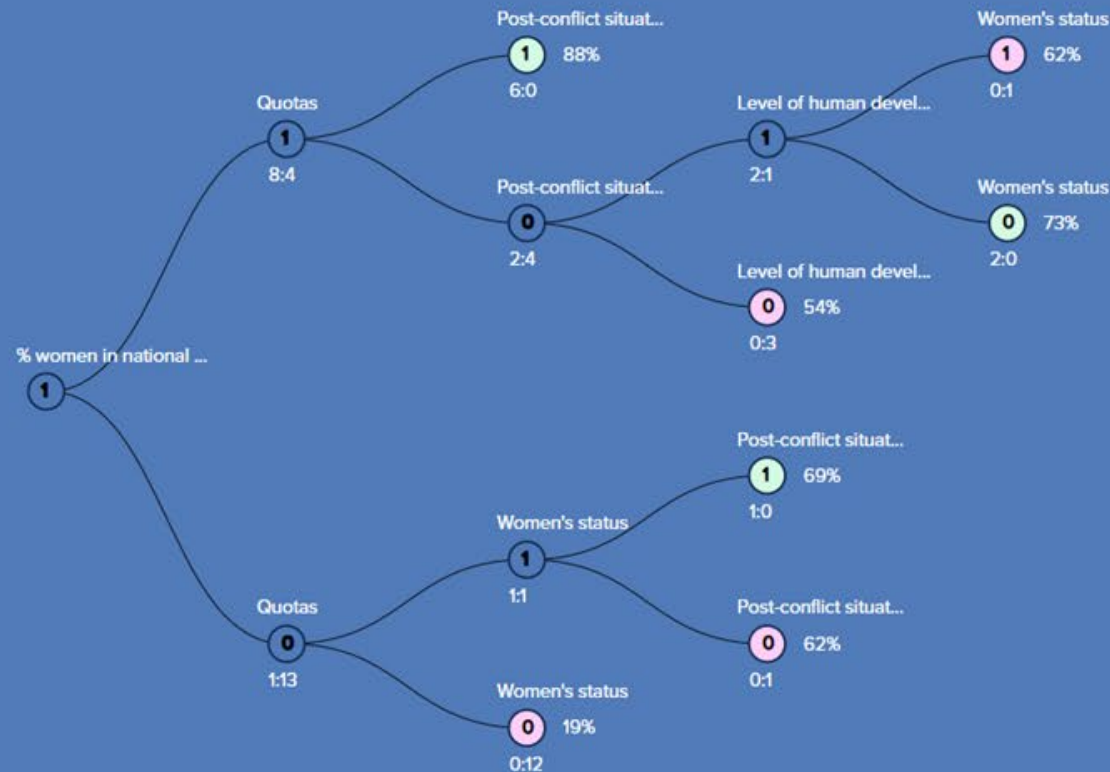
[How to use](#) [About EvalC3 Online](#) [Sign Out](#)

View Decision Tree [Learn more about viewing the decision tree](#)

[← Back](#) [↺ Start Again](#)

Accuracy 100.00% True Positive 34.62% True Negative 65.38% False Positive 0.00% False Negative 0.00%

Key ● Positive ● Draw ● Negative Outcome a:b a = outcome present, b = outcome absent 1 Decision Nodes



Using EvalC3 in practice

Potential use cases

- What questions?
 - What hypotheses?
- What kinds of data?
- What sources?
- Who would want to see the results?
- Description / prediction / explanation

EvalC3 Training Feedback Form

Feedback

<https://forms.office.com/e/mCRQL0YYNN>

