

Data Models for Vulnerability

revision	on	by	notes
1	11/03/2026	Paul Davidson, SAVVI	Describing version 1.0.0 Baseline of the Concept Model and the Logical Model
2	25/03/2026	Paul D	Improved Place Entity properties. Version 1.0.1 of the Logical Model
3	15/06/2026	Paul D	Version 1.02 of the Logical Model Registered Sex, and Gender, adjusted to use a locally agreed code list, rather than stipulating the allowed values as an enumeration.

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About

This document proposes a Concept Model and a Logical Data Model, to find and support people who may be at risk of a vulnerability.

The models are designed to

- facilitate multi-agency data sharing and collaboration
- promote a componentised and reusable component architecture
- support lawful, ethical, and transparent use of data

This revision of the document presents the models as baselined at version 1.0.0

The models have been conceived by the SAVVI programme, and scrutinised and refined by the [Data Standards Authority](#) Vulnerability Working Group; both are explained later in the document.

Vulnerability defined

Public services increasingly recognise the importance of prevention; identifying people and households at risk early, and coordinating support before problems escalate.

However, services often operate in silos. Data is fragmented across organisations, legal interpretations vary, and local innovation is difficult to scale. As a result, people can fall through gaps between services, and prevention efforts are inconsistent.

The Concept Model defines Vulnerability as ...

The increased risk of a poor outcome.

That might include

- experiencing financial hardship
- being unsafe during adverse weather such as a flood
- a child not being ready to start school
- being economically inactive
- becoming homeless

These models are designed to facilitate early identification and smarter intervention by ...

- finding people who we otherwise don't know about, who may be at risk of a vulnerability
- assessing needs
- referring to support services

- reporting on outcomes and impact

The DSA Vulnerability Working Group

The [Data Standards Authority](#) (DSA) has established the [Vulnerability Working Group](#), as a cross government group, to bring forward

- Data Standards
- Terminologies
- Information Governance and Trust

... to encourage a framework for interoperability across organisations taking part in a Vulnerability initiative.

The working group has reviewed various examples of vulnerability initiatives, and taken the outputs of the SAVVI programme as a starting point. As the group has improved and refined the SAVVI work, the SAVVI programme has folded them back into its outputs.

With the proposed Data Standards now baselined at version 1.0.0, the working group will continue to develop them as it learns from testing and prototyping. The Government Digital Service encourages representation from across the UK public sector to participate.

The SAVVI Programme

SAVVI is a framework to enable early identification and smarter interventions, for vulnerable people. You can find out more about SAVVI at <https://www.savviuk.org>

[SAVVI](#), standing for ‘a **S**calable **A**pproach to **V**ulnerability via **I**nteroperability’, is a programme hosted by [Tameside Council](#), developed by [iStandUK](#), and funded by the Ministry of Housing, Communities and Local Government (MHCLG) [Local Digital Fund](#).

SAVVI provides a practical framework to enable organisations to:

- identify people and households at increased risk of poor outcomes
- share and reuse existing data lawfully, ethically and transparently
- coordinate support across organisational boundaries
- avoid building single-use systems for each new priority

The SAVVI website has

- a five minute video on the [home page](#)
- [case studies](#) of examples of Vulnerability
- [the models](#) laid out in this document

Sharing Data for Vulnerability

Often, no single organisation has all the data that could indicate the risk of a vulnerability, and no single organisation has all the support offers that are relevant; so tackling a vulnerability requires multi-agency data sharing and collaboration. In particular

- matching up risk factors derived from across disparate organisations and datasets
- creating prioritised cohorts of people who may be at risk

- assessing needs and referring to a collection of support services
- consistent cross organisational reporting on outcomes

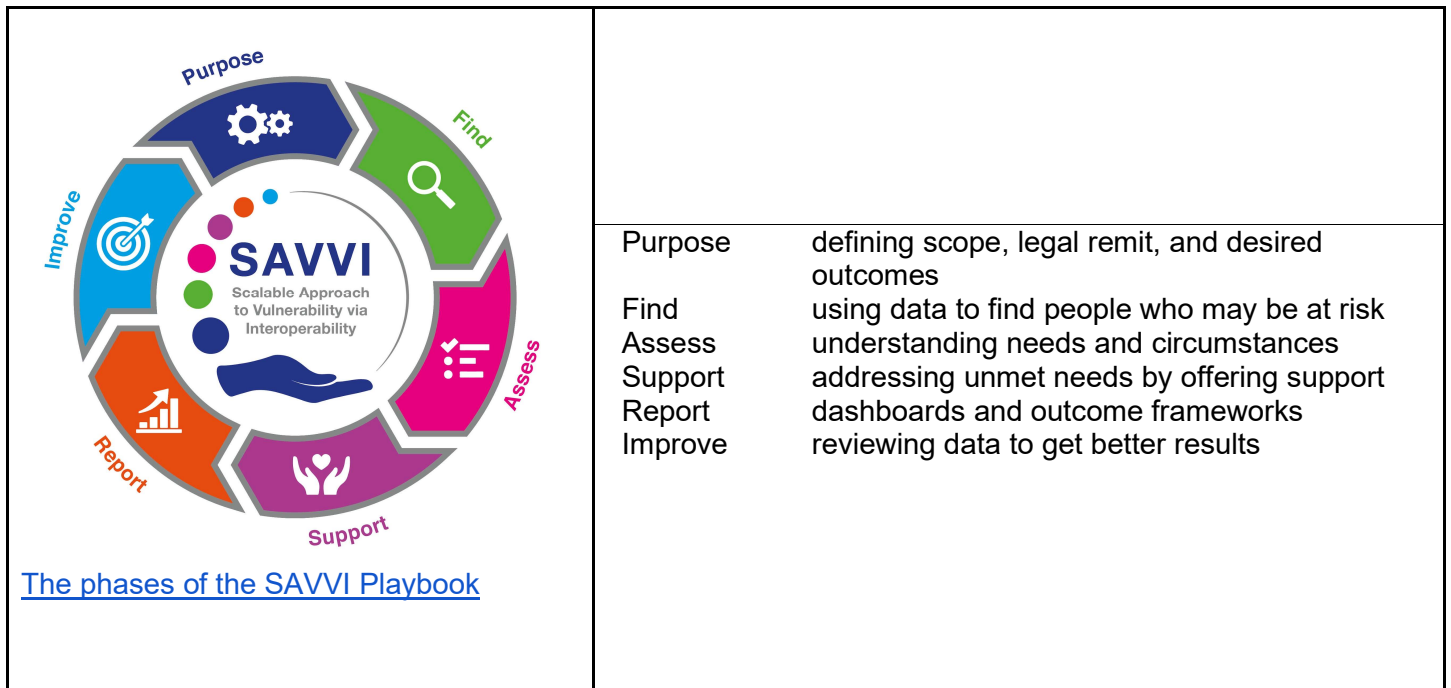
Privacy and Security needs to be built in so that

- only sufficient information is shared at each stage
- data sharing is lawful and ethical
- data handling is secure and accountable

A common repeatable process

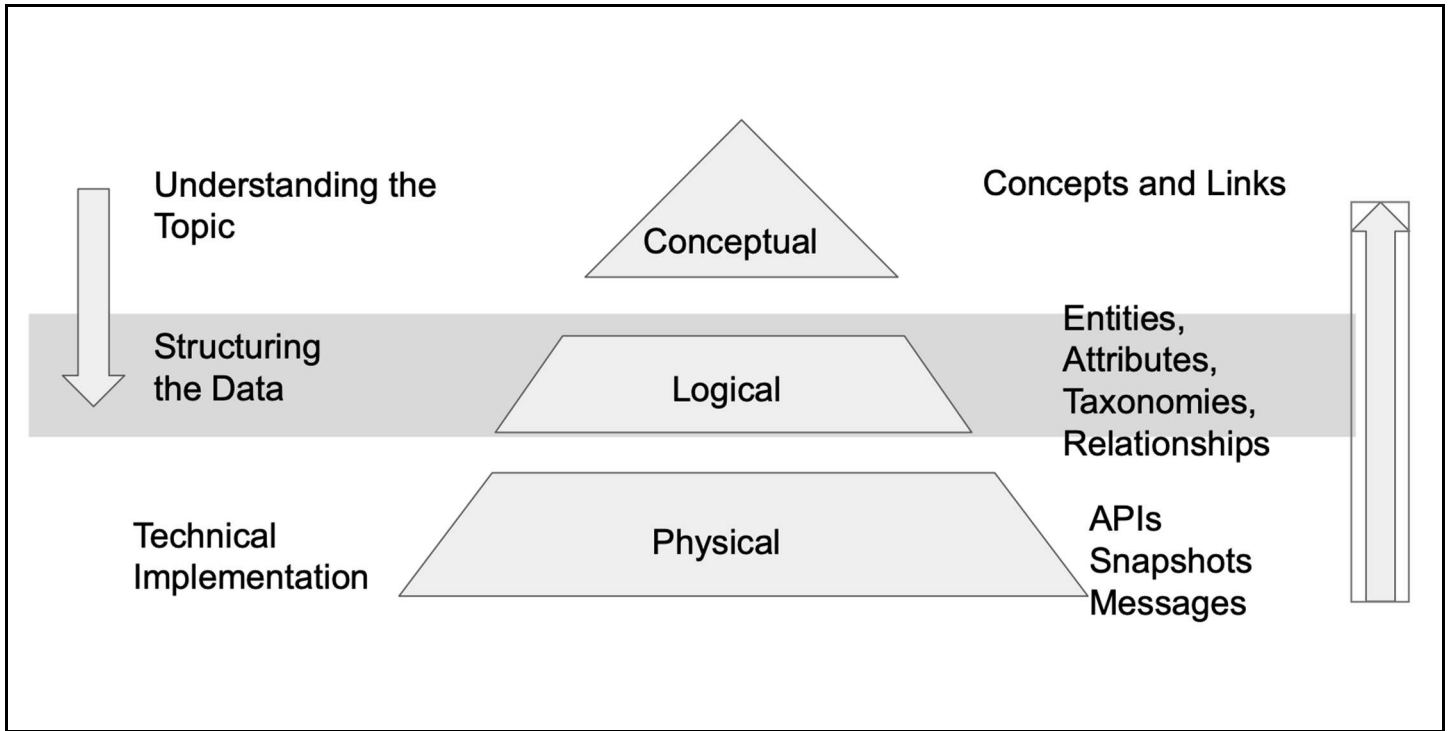
The data models have been designed to enable data to flow around a common process that can be applied to any vulnerability.

SAVVI defined the common process as ...



Modelling

The proposed data models are developed at three levels.



<ul style="list-style-type: none"> • Concept Model 	Identifying Concepts and how they can be linked. Giving each a precise definition to establish a consistent language.
<ul style="list-style-type: none"> • Logical Model 	Defining data entities and structures as a 'menu' for transacting data.
<ul style="list-style-type: none"> • Physical Model 	Defining data sharing formats tuned to particular use cases

The Concept Model

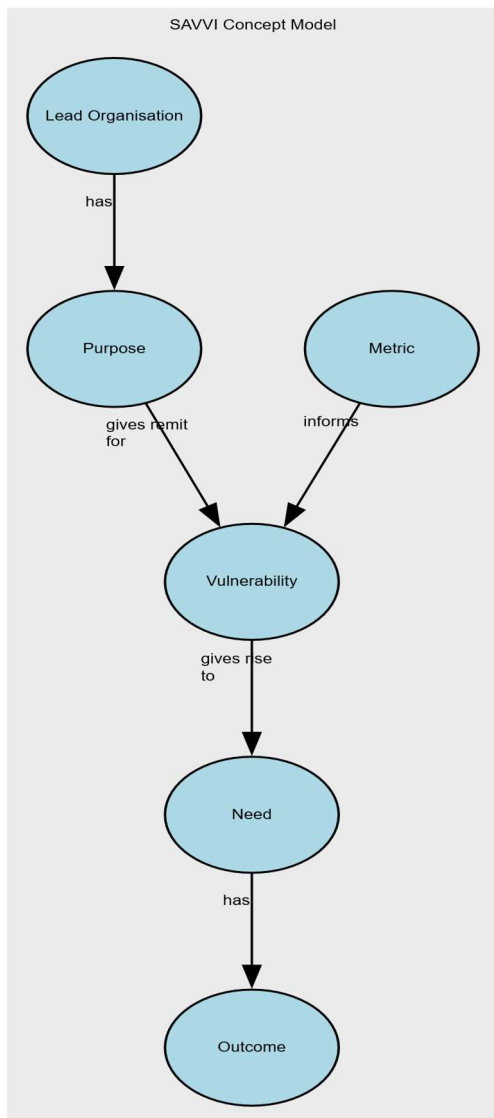
This document presents the Concepts from the Concept Model as they are introduced at each phase of the SAVVI Process, and then, shows the whole model. These views of the Concept Model are also shown at [the SAVVI website](#) together with various machine readable formats including

- [RDF Schema](#) (RDFS)
- [comma separated values](#) (CSV)

The Purpose phase

In the Purpose phase

- a LEAD-ORGANISATION will establish that it has a PURPOSE that gives it a remit to act on one or more VULNERABILITIES.
- where the PURPOSE gives the basis for data sharing and data reuse throughout the initiative.
- some METRICS may be used as statistics to demonstrate that each type of VULNERABILITY is an imperative, and which could subsequently be used to track the impact of the whole initiative.
- will set out types of unmet NEEDs, which, if addressed by smart interventions, could lead to improved OUTCOMES.



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Concepts introduced in the Purpose phase

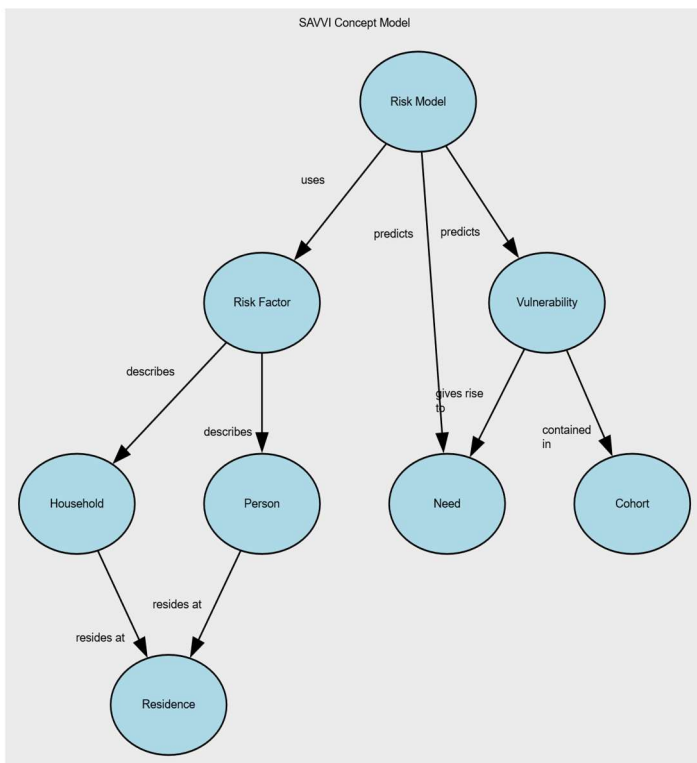
Lead Organisation	An organisation responsible for coordinating a vulnerability initiative, and with remit for the PURPOSE.
Metric	A statistic that evidences the imperative for a VULNERABILITY to be addressed.

Need	An unmet requirement of a Person or Household that can be addressed.
Outcome	A result that has been achieved by addressing the NEEDs of a Person or Household.
Purpose	The remit that an Organisation has to carry out an initiative covering one or more VULNERABILITYs.
Vulnerability	The increased risk of a poor outcome.

The Find phase

In the Find phase

- a vulnerability initiative will establish a RISK MODEL for a VULNERABILITY.
- which sets out the rules by which RISK-FACTORS will be used
- to generate and prioritise a COHORT
- of PERSONs or HOUSEHOLDs
- with potential NEEDs.



Concepts introduced in the Find phase

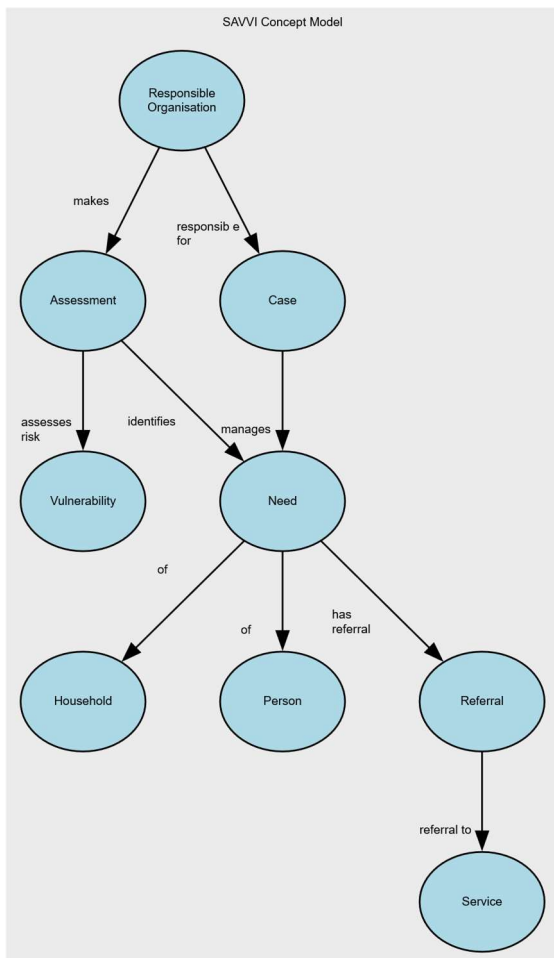
Cohort	An initial prioritised list of people and households that may have a risk of a VULNERABILITY.
Household	A collection of PERSONs who live together at the same RESIDENCE.

Person	An Individual who may be vulnerable.
Residence	A home of a PERSON
Risk Factor	A single fact about a Person or Household that can be combined with others to categorise the risk of a VULNERABILITY , and predict NEEDs.
Risk Model	The rules by which RISK FACTORs will be used to prioritise VULNERABILITY risk, and predict NEEDs.

The Assess phase

In the Assess phase

- A RESPONSIBLE-ORGANISATION may choose to raise a CASE about PERSON or HOUSEHOLD, for example, if
 - they appear in a COHORT
 - they present themselves as vulnerable
 - they are referred by another organisation or professional
- an ASSESSMENT will capture new circumstance information and identify one or more NEEDs.
- each NEED can then have a REFERRAL to a SERVICE
- offered by a DELIVERY-ORGANISATION.



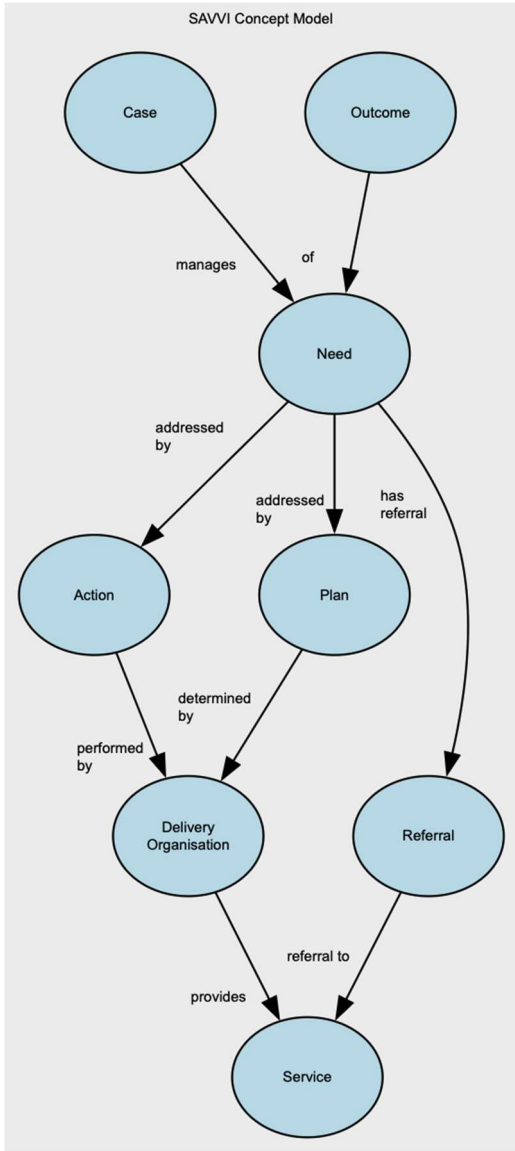
Concepts introduced in the Assess phase

Assessment	An understanding of NEEDs and circumstances.
Case	A container for information recording the history of events for a PERSON or HOUSEHOLD who may have NEEDs.
Referral	A decision to direct a NEED to a support SERVICE.
Responsible Organisation	An organisation who is made responsible for a CASE.
Service	The ability for a Delivery Organisation to carry out one or more predetermined methods designed to deliver an OUTCOME.

The Support phase

In the Support phase

- a NEED may have a REFERRAL
- to a SERVICE provided by a DELIVERY-ORGANISATION.
- which may
 - create a PLAN
 - record individual ACTIONS.
- which can be recorded on the CASE.
- Each NEED will reach an OUTCOME which may have been achieved via a REFERRAL



Concepts introduced in the Support phase

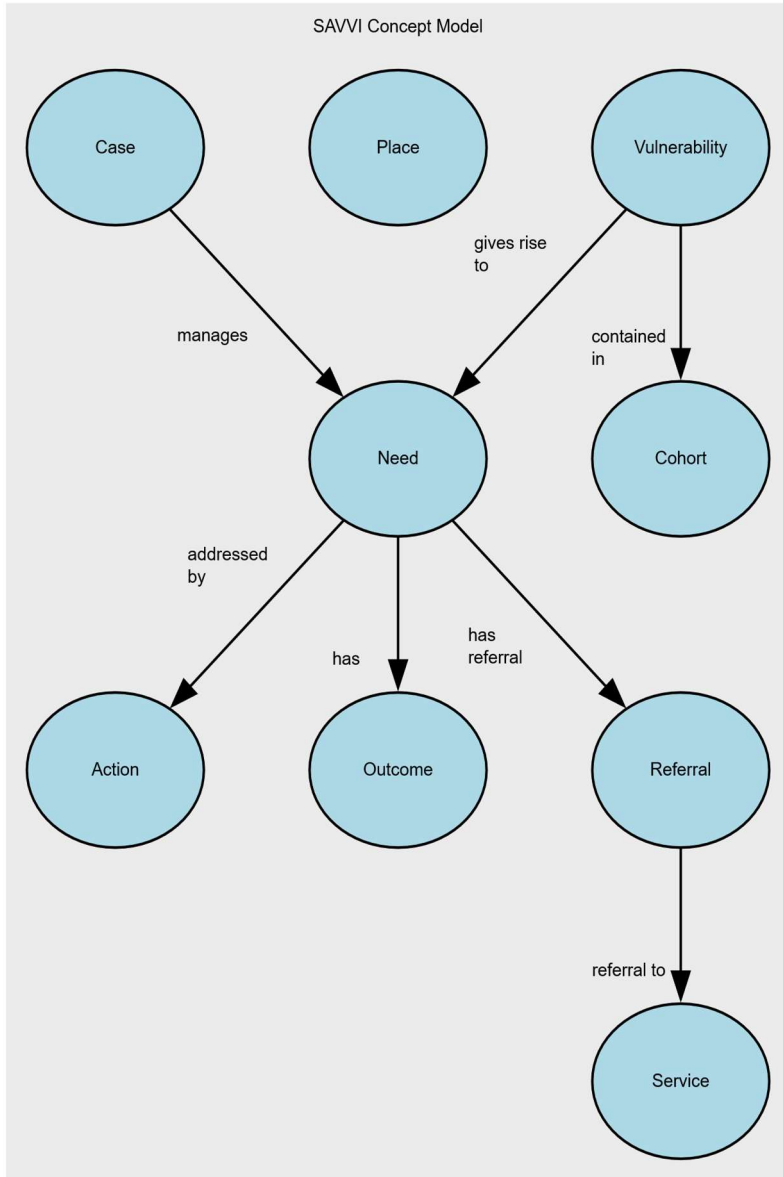
Action	An action that has been carried out as a part of responding to a NEED.
Delivery Organisation	A service provider who delivers actions that respond to a NEED.
Plan	A set of planned actions designed to respond to a NEED over a period.

The Report phase

In the Report phase

- a dashboard can be created that can report on caseload information such as
 - how many items are in COHORT
 - how many CASEs have had an ASSESSMENT
 - how many of each type of unmet NEED have been found

- how many REFERRALS have been made to each SERVICE
- what OUTCOMES have been achieved
- the report can be split by PLACE of the RESIDENCE of HOUSEHOLDS.
- when limited to a time period, this information can produce an Outcomes Framework.



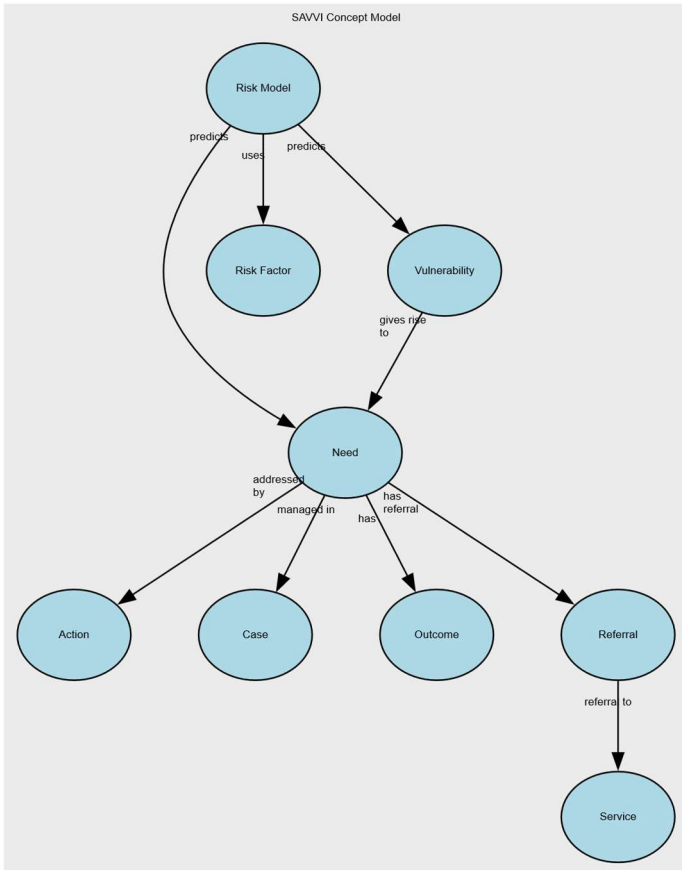
Concepts introduced in the Report phase

Place	A geographic area.
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The Improve phase

In the Improve phase

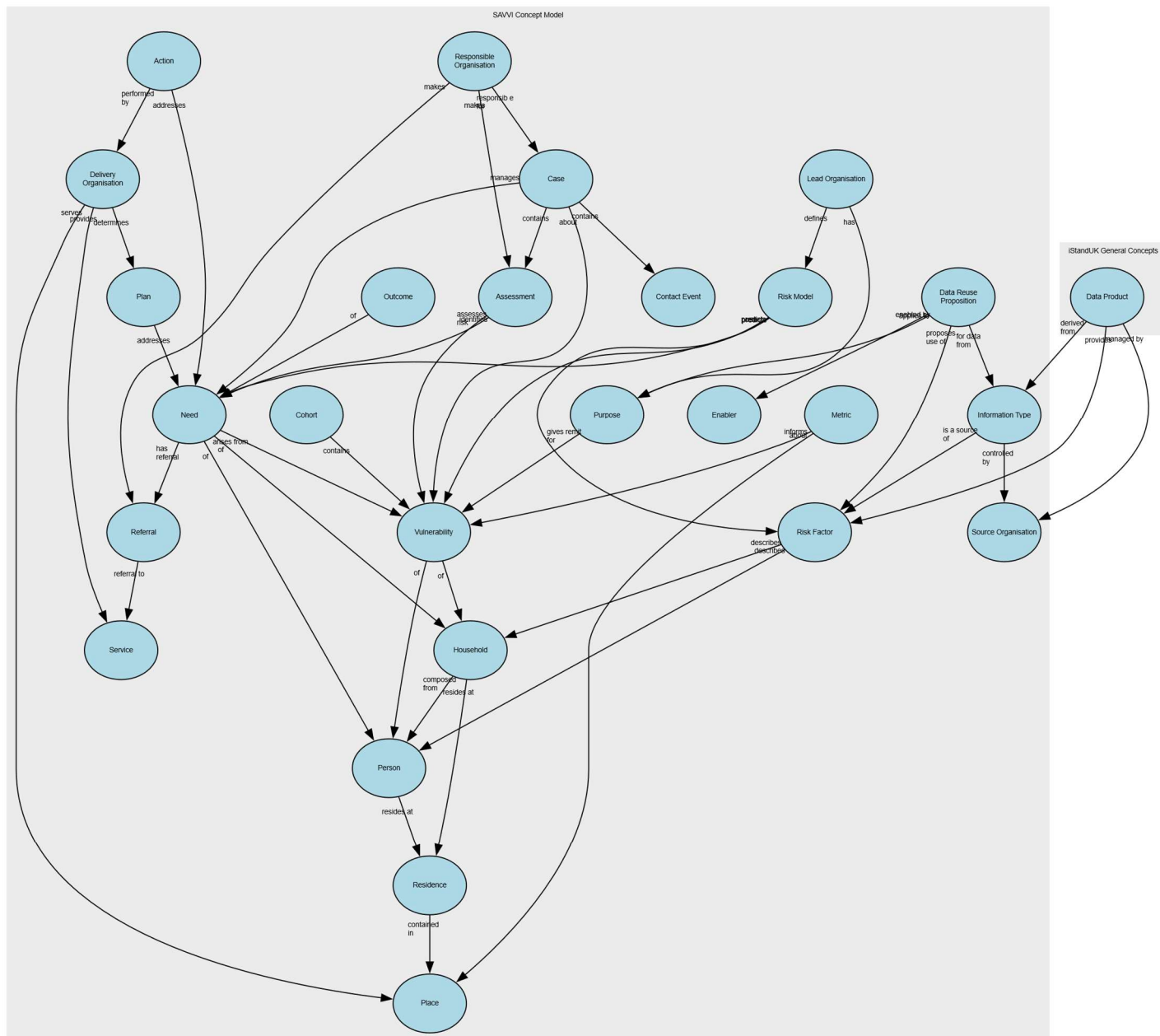
- having used data to Find and Support vulnerable people
- there is an opportunity to review anonymised CASE data
- to create insights as to how the process could be improved.
- In particular, improvements could be made to
 - the rules and weightings in the RISK-MODEL
 - the use, and data quality of RISK-FACTORS
 - prediction of NEEDS
 - the REFERRALS of NEEDS to SERVICES that lead to good OUTCOMES



Concepts introduced in the Improve phase

No new concepts are introduced for the Improve phase, as this is about analysing data already collected during the operation of the process.

The whole Concept Model



Definitions

Action	An action that has been carried out as a part of responding to a NEED.
Assessment	An understanding of NEEDs and circumstances.
Case	A container for information established to manage one or more NEEDs for a PERSON or HOUSEHOLD, through which events, evidence, activities, and decisions are recorded and tracked over time in order to achieve an intended OUTCOME.
Cohort	An initial prioritised list of people and households that may have a risk of a VULNERABILITY.

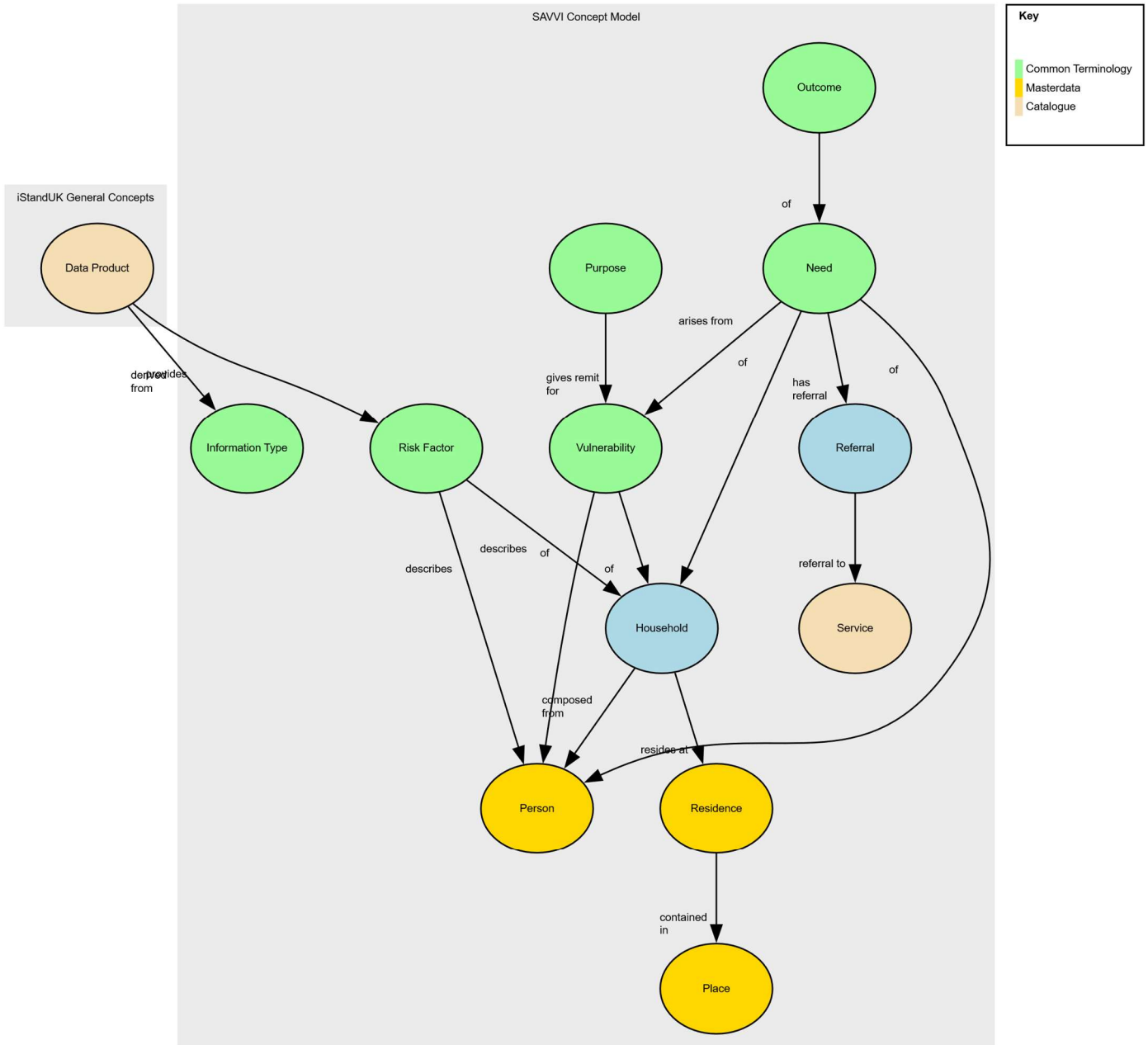
Contact Event	A record of an event in which the situation of a person or household was sought.
Delivery Organisation	A service provider who delivers actions that respond to a NEED.
Household	A collection of PERSONs who live together at the same RESIDENCE.
Lead Organisation	An organisation responsible for coordinating a vulnerability initiative, and with remit for the PURPOSE.
Metric	A statistic that evidences the imperative for a VULNERABILITY to be addressed.
Need	An unmet requirement of a Person or Household that can be addressed.
Outcome	A result that has been achieved by addressing the NEEDs of a Person or Household.
Person	An Individual who may be vulnerable.
Plan	A set of planned actions designed to respond to a NEED over a period.
Purpose	The remit that an Organisation has to carry out an initiative covering one or more VULNERABILITYs.
Referral	A decision to direct a NEED to a support SERVICE.
Residence	A home of a PERSON
Responsible Organisation	An organisation who is made responsible for a CASE.
Risk Factor	A single fact about a Person or Household that can be combined with others to categorise the risk of a VULNERABILITY , and predict NEEDs.
Risk Model	The rules by which RISK FACTORs will be used to prioritise VULNERABILITY risk, and predict NEEDs.
Service	The ability for a Delivery Organisation to carry out one or more predetermined methods designed to deliver an OUTCOME.
Vulnerability	The increased risk of a poor outcome.

Reference Data, Masterdata and Catalogues

Some of the Concepts indicate a further requirement for

<ul style="list-style-type: none"> Terminology 	a controlled and shared set of terms and definitions used to ensure consistent understanding and interpretation of concepts across organisations, systems, and services.
<ul style="list-style-type: none"> Master Data 	authoritative core data describing key entities such as people, organisations, or places that is shared and reused across multiple systems.

<ul style="list-style-type: none"> • Catalogues 	a structured listing of available resources, such as services or data sources, published so they can be discovered and used.
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Use Cases for Interoperability

The SAVVI Process suggests various opportunities where data could be exchanged

- between technology components or platforms
- over organisational boundaries

... such as

<ul style="list-style-type: none"> • Access to RISK FACTOR data 	pulling RISK FACTOR data from a data product, for a specified PURPOSE to the build a COHORT or PERSONS/HOUSEHOLDS who may be at risk of a VULNERABILITY
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<ul style="list-style-type: none"> • Discovering support SERVICES 	matching assessed NEEDs to lookup a shared Directory of SERVICES
<ul style="list-style-type: none"> • Making Referrals 	referring a NEED to a SERVICE, and tracking OUTCOMES
<ul style="list-style-type: none"> • Shared Casework 	a single view of a case built from disparate REFERALLs, PLANs and ACTIONs
<ul style="list-style-type: none"> • Reporting to a shared dashboard 	collecting REFERRALS and OUTCOMES data from partners to monitor COHORTs and CASEs

These opportunities have influenced the design of the Logical Model.

The Logical Model

This document presents the whole Logical Model, and then shows each Entity in detail. These views of the Logical Model are also shown at [the SAVVI website](#) together with various machine readable formats including

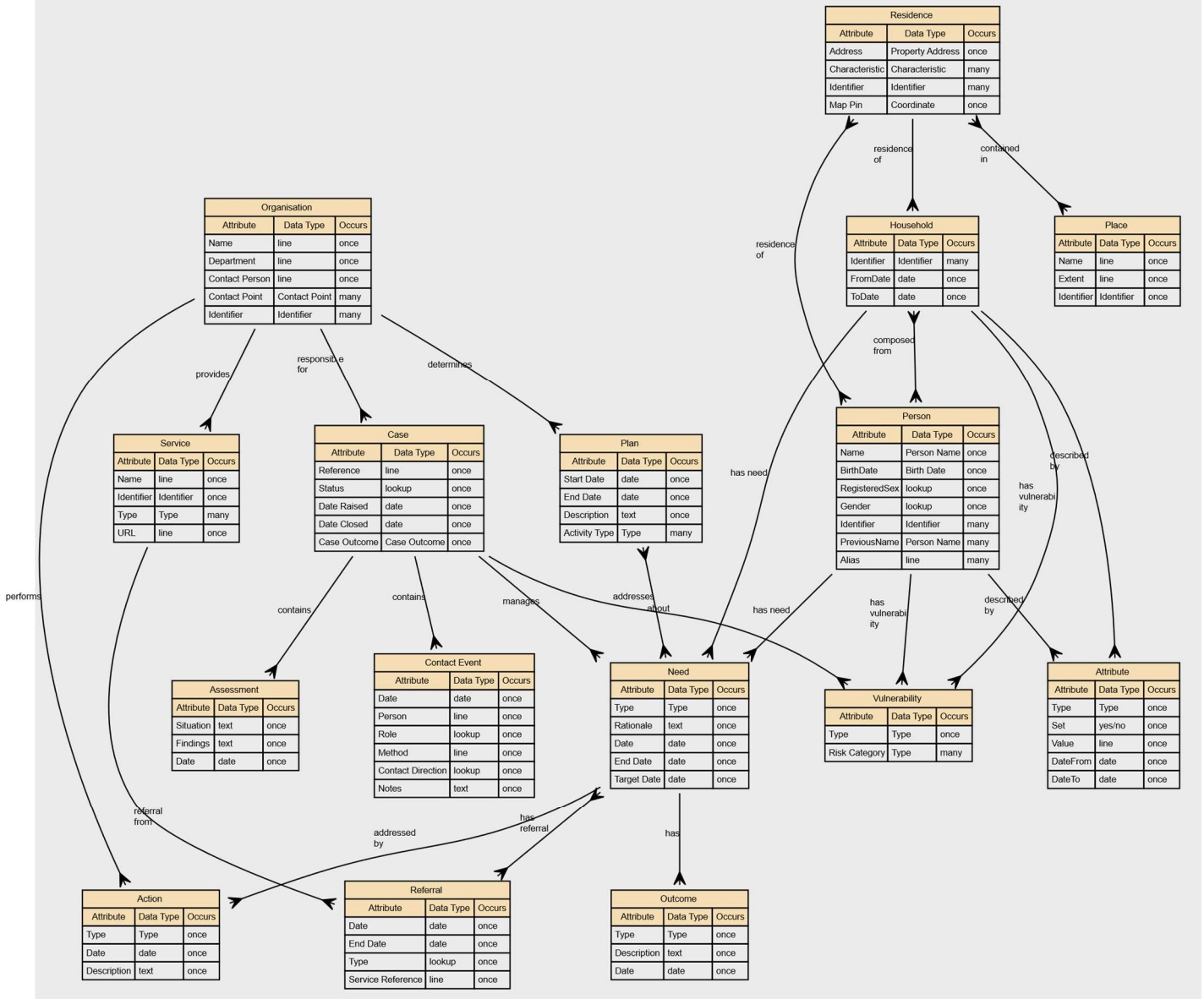
- [RDF Schema](#) (RDFS)
- [XML Schema](#) (XSD)
- [comma separated values](#) (CSV)

The Logical Model

- is a menu to derive interchange formats for Interoperability
- has no new ideas - these implement the Concept Model
- is NOT intended for data at rest
- is designed to be extensible, avoiding hard-coded fields for particular vulnerabilities, so that new risk factors, needs, identifier schemes, and so on, can be added without changing the core model.

Each Entity in the model is further defined in Appendix B - Entity Definitions.

SAWVI Logical Model



Domain Expert Groups

In parallel to this Vulnerability work, the [Data Standards Authority](#) (DSA) is also running 'expert groups' to look at some entities that commonly occur in shared data, to propose a common data structure to be applied consistently across public sector data.

The Vulnerability Logical Model will adopt those structures as they are issued.

Appendix A - Common Structures

Some data structures are used repeatedly across the Logical Model

Type

The Type structure records a Term as the type of an Entity. For example

- Risk Factor: Court Action
- Need: Family Counselling

As a minimum, a Term should be provided. Better is to provide a Term within a shared Scheme (Terminology), and best is to provide a URI which can be dereferenced to give a precise definition of the Term.

Attribute		Data Type	Structure	occurs	required
Scheme	To define the scheme that the type is taken from. e.g. 'LG Inform Circumstance List'	lookup		once	
Term	A term that represents a type. e.g. 'unemployed'. Where a scheme has been defined, this should be a term from that scheme.	line		once	yes
URI?	A persistent identifier for the Term. This should be an HTTP Resolvable Identifier - see Persistent resolvable identifiers - GOV.UK (www.gov.uk)	yes/no		once	

Identifier

The Identifier structure records an identifier from a scheme. For example,

- unique pupil number:A123456789001A
- UPRN: 100021064336

Entities often have an array of Identifiers, so that many can be recorded.

Attribute		Data Type	Structure	occurs	required
Scheme	The name of a controlled set of identifiers	lookup		once	
Reference	A reference to uniquely identify a thing	line		once	yes

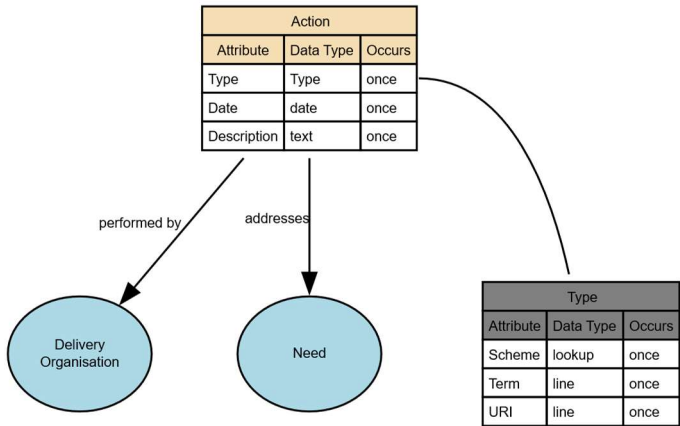
Pseudonymised?	To indicate that the reference is pseudonymised	yes/no		once	
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Coordinates

Attribute	Description	Data Type	Structure / Terminology	Occurs	Required
Latitude	The latitude of a position expressed using the WGS84 datum.	number		once	yes
Longitude	The longitude of a position expressed using the WGS84 datum.	number		once	yes

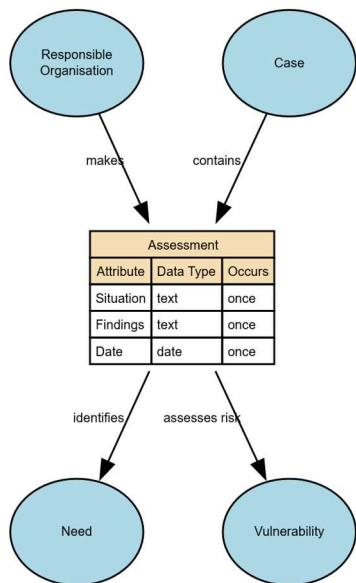
Appendix B - Entity Definitions

Action



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Type	The type of action - e.g. * food parcel * debt advice		Type	once	
Date	The date of the Action.	date		once	yes
Description	A description of the Action.	text		once	

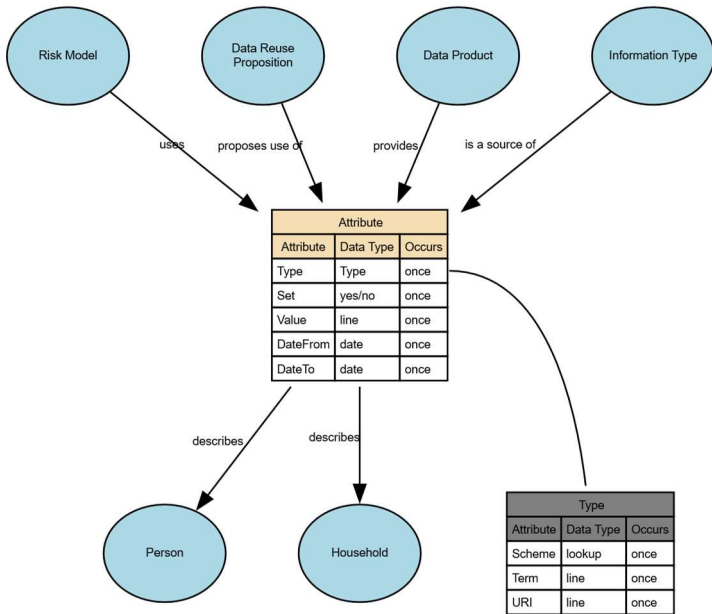
Assessment



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Situation	A record of the situation to be assessed.	text		once	
Findings	A judgement of the Needs arising from the Situation.	text		once	
Date	The date of the Assessment	date		once	

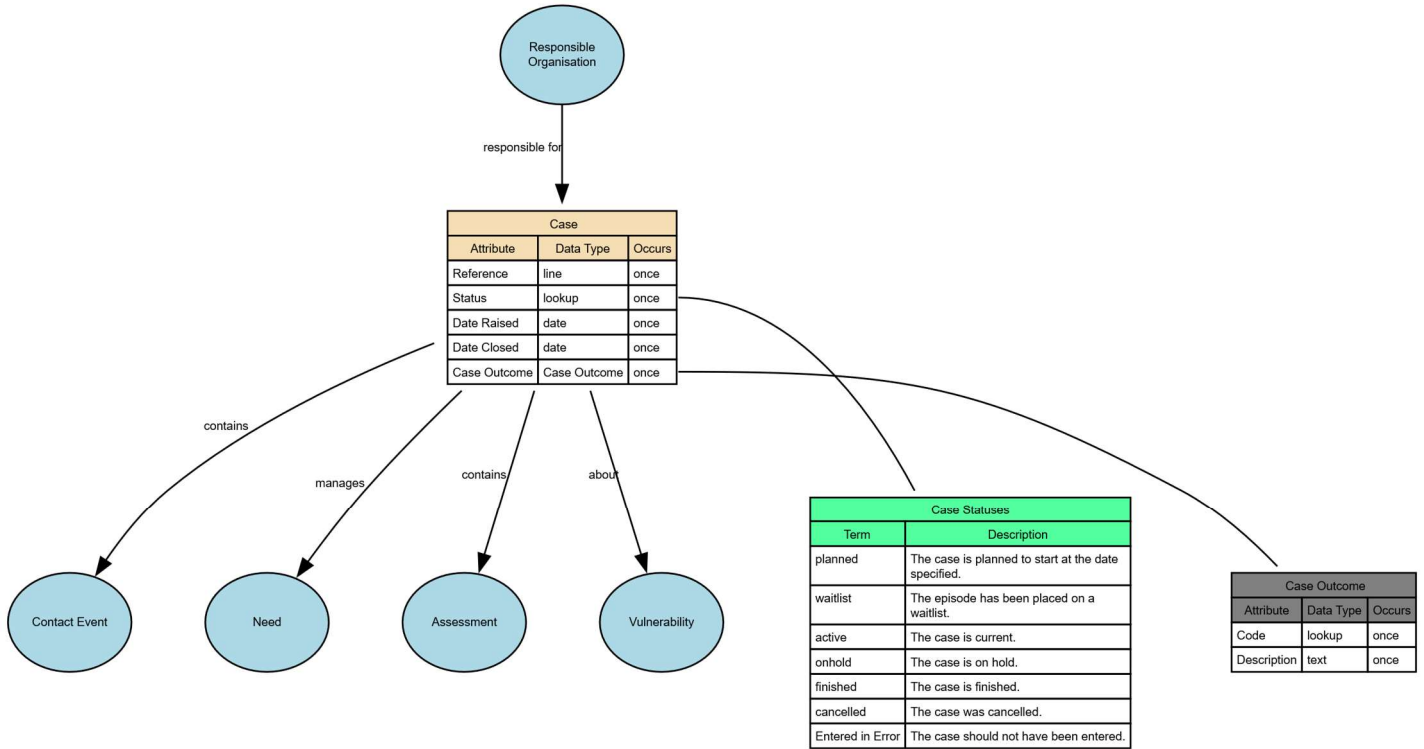
Attribute

Implements the 'Risk Factor' concept



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Type	To describe the Attribute. e.g. In receipt of Universal Credit, Living Alone.		Type	once	yes
Set	To indicate if the presence of the Attribute is true or false.	yes/no		once	yes
Value	An optional value associated with an Attribute, e.g. if the Type is '% attendance', the Value may be 60.	line		once	no
DateFrom	The date from which the Attribute is true.	date		once	
DateTo	The date from which the Attribute may no longer be true, or is expected to end.	date		once	

Case



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Reference	The Case Reference.	line		once	yes
Status		lookup	Case Statuses	once	
Date Raised	The date that the Case was started.	date		once	
Date Closed	The date that the Case was closed.	date		once	
Case Outcome			Case Outcome	once	

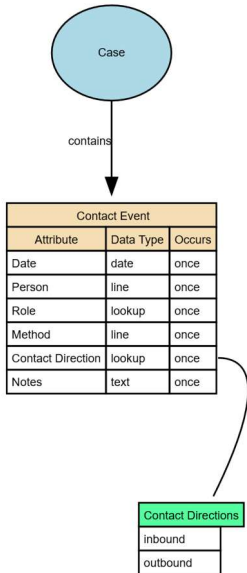
Structures

Case Outcomes

Name	Description	Data Type	Structure / Terminology	Occurs	Required
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Code		lookup		once	yes
Description		text		once	

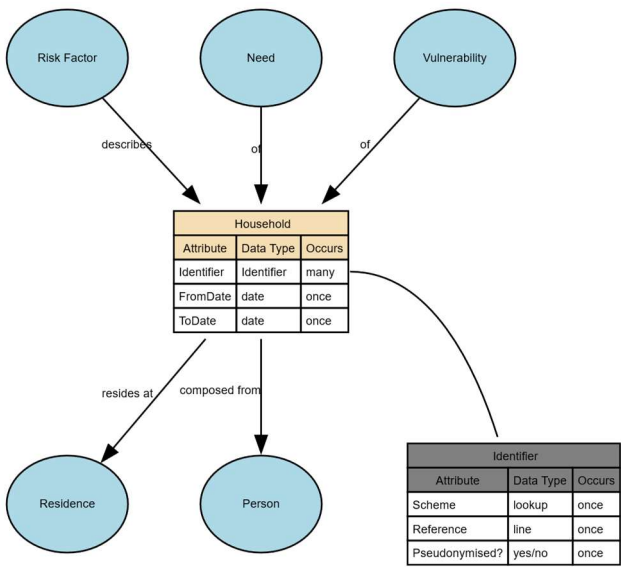
Contact Event



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Date	The date of the contact.	date		once	
Person	The name of the contacted person	line		once	
Role	The role of the contacted person e.g. * Vulnerable Person * Friend * Relative * Public * Professional * Community Group * Elected Representative	lookup		once	

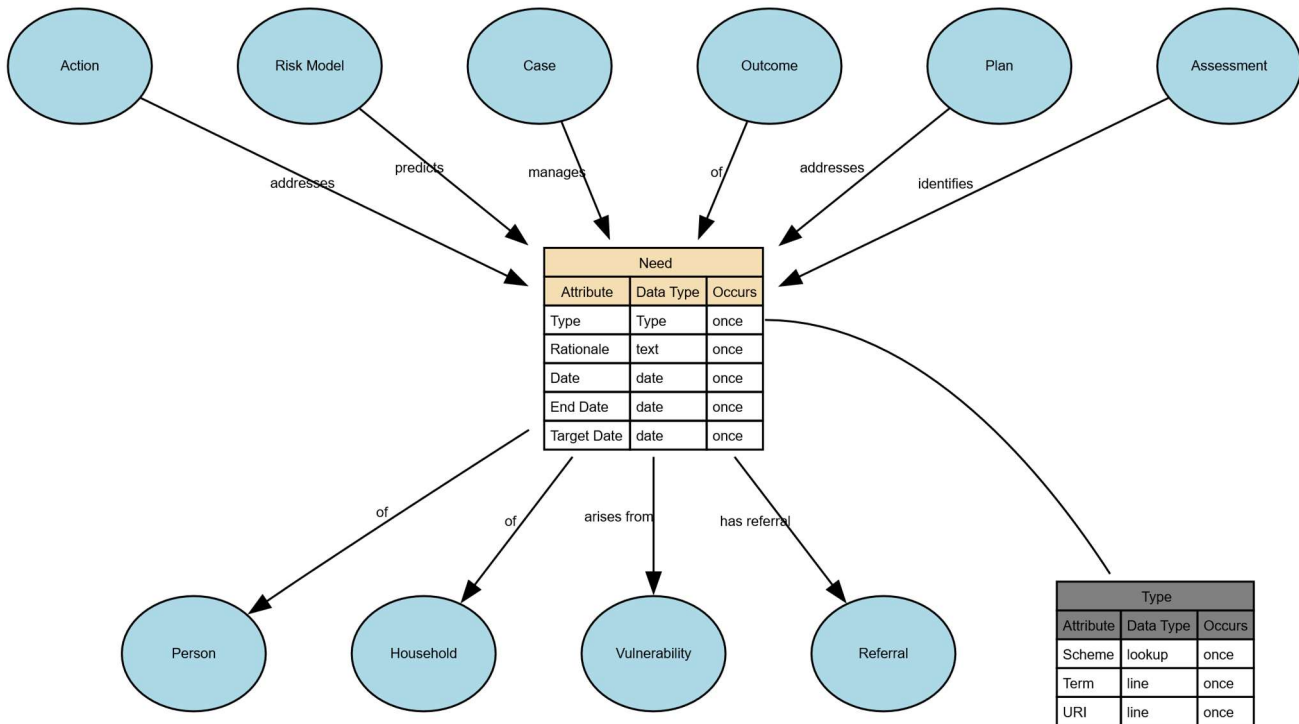
Method	The method used to make the contact e.g. * phone * home visit * digital	lookup		once	
Contact Direction	To indicate who initiated the contact.	lookup	Contact Directions	once	
Notes	Notes of the Contact Event	text		once	

Household



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Identifier			Identifier	many	
FromDate	A date from which the Household is known to be formed.	date		once	
ToDate	A date after which the Household may not be formed.	date		once	

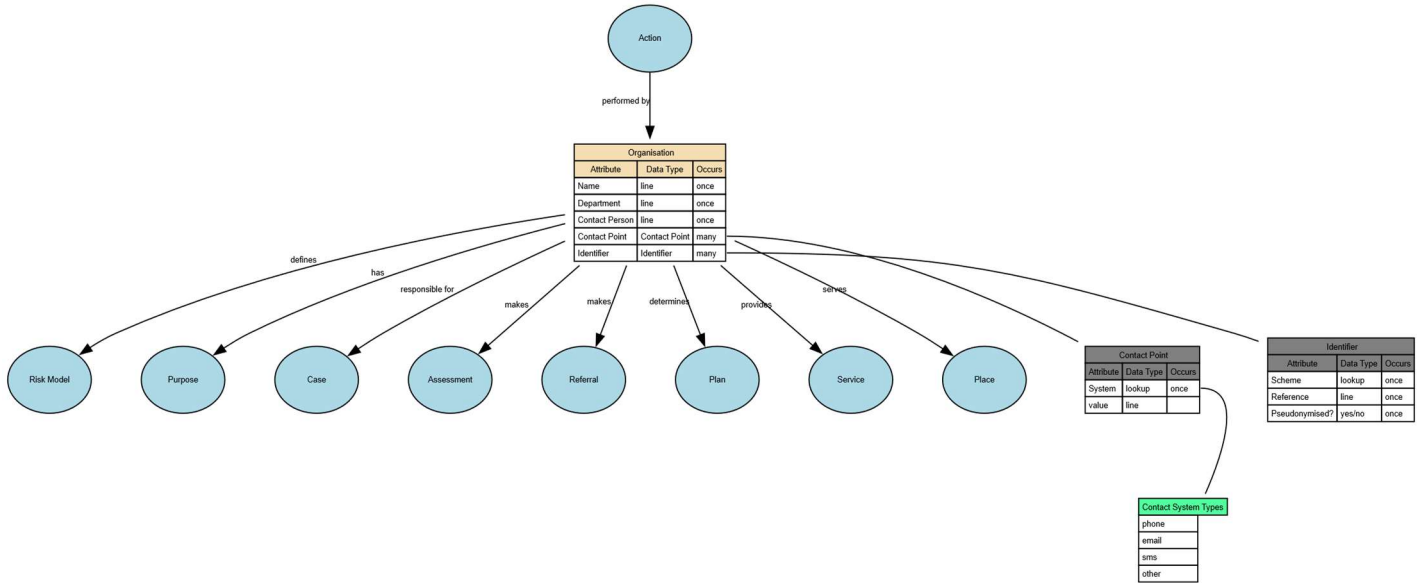
Need



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Type			Type	once	yes
Rationale	The reasoning for the Need.	text		once	
Date	The date that the Need is established.	date		once	
End Date	The date that the Need was resolved.	date		once	
Target Date	The date that the Need should be resolved by, for it to be effective.	date		once	

Organisation

Implements the 'Lead Organisation', 'Responsible Organisation' and 'Delivery Organisation' concepts.



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Name		line		once	yes
Department		line		once	
Contact Person		line		once	
Contact Point			Contact Point	many	
Identifier	Reference by which the organisation is known, e.g. * GDS Register of Local Authorities * Companies House Number * Charity Number		Identifier	many	

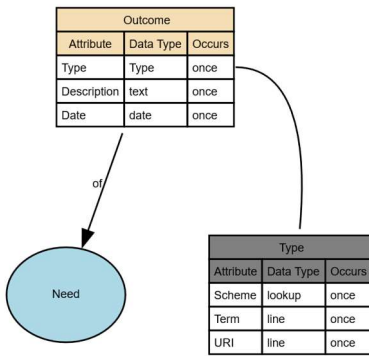
Structures

Contact Point

Name	Description	Data Type	Structure / Terminology	Occurs	Required

System	Telecommunications form for contact point	lookup	Contact System Types	once	
value		line			

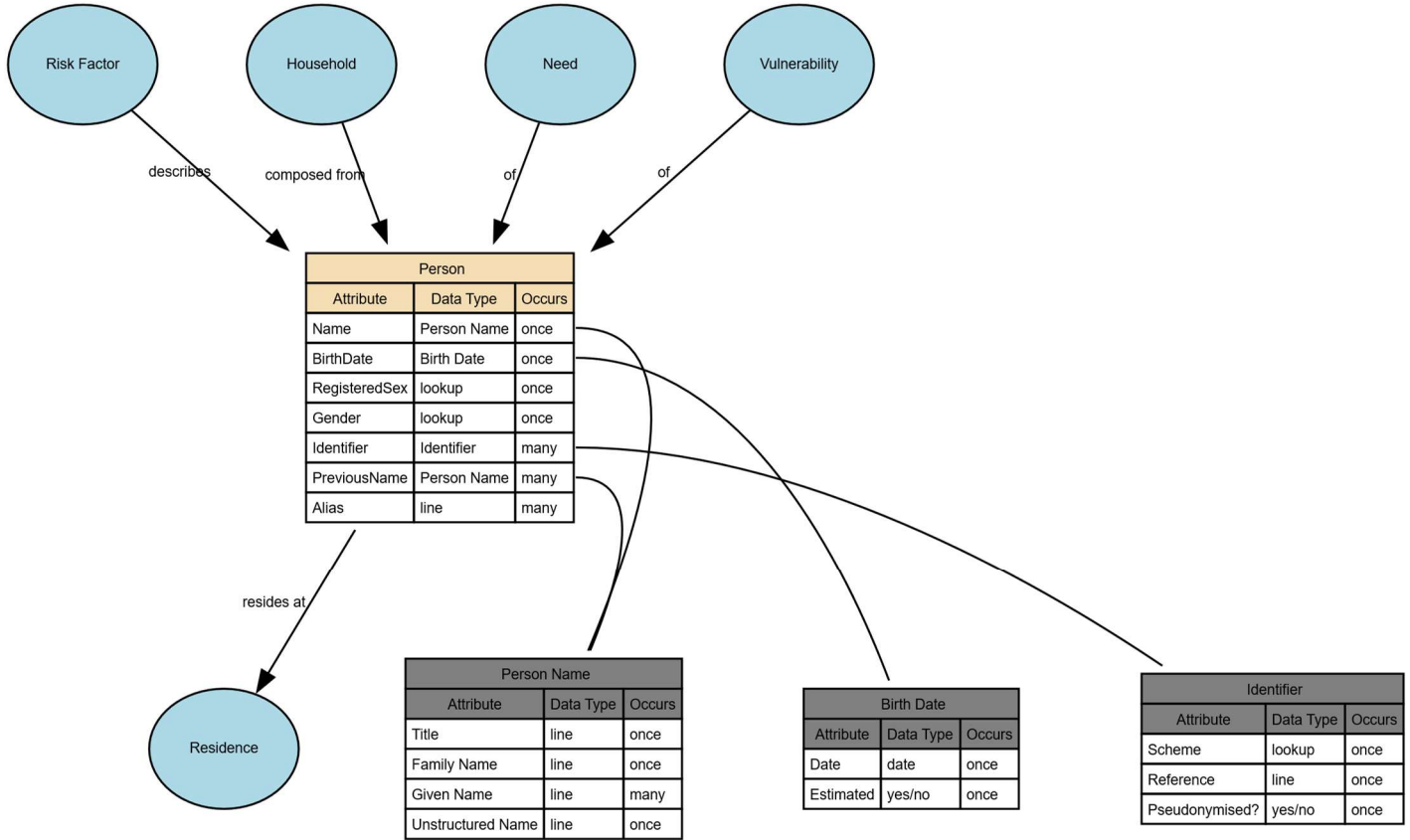
Outcome



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Type			Type	once	yes
Description	A description of the Outcome.	text		once	
Date	The date that the Outcome was achieved.	date		once	

Person

NOTE:- A common data specification to represent a PERSON is currently being developed by a DSA Domain Expert Group. The Vulnerability Logical Model will take on data structures from that work when it is available.



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Name	The official name of a person.		Person Name	once	
BirthDate	The date that a person was born.		Birth Date	once	
RegisteredSex	The sex recorded for a person in an official civil registration or legal record, such as the sex recorded at birth. Use an agreed code list such as Codesystem-administrative-gender - FHIR v5.0.0	lookup		once	no
Gender	A social category for the sex that a person self-presents as. Use an agreed code list such as Codesystem-administrative-gender - FHIR v5.0.0	lookup		once	no

Identifier	References by which a person is known, in various schemes. e.g. NiNo, Health Number, a local reference.		Identifier	many	
PreviousName	Names that a person has previously been known as.		Person Name	many	no
Alias	An assumed or additional name that a Person sometimes uses, or a shortened diminutive version of a name, e.g. Betty, Smithy, by which a Person is generally known by family and friends, or to a Service.	line		many	

Structures

Person Name

Name	Description	Data Type	Structure / Terminology	Occurs	Required
Title		line		once	
Family Name		line		once	
Given Name		line		many	
Unstructured Name	A rendition of the name that does not attempt to indicate meaning of the parts in the name. e.g. Mr Bert Smith.	line		once	

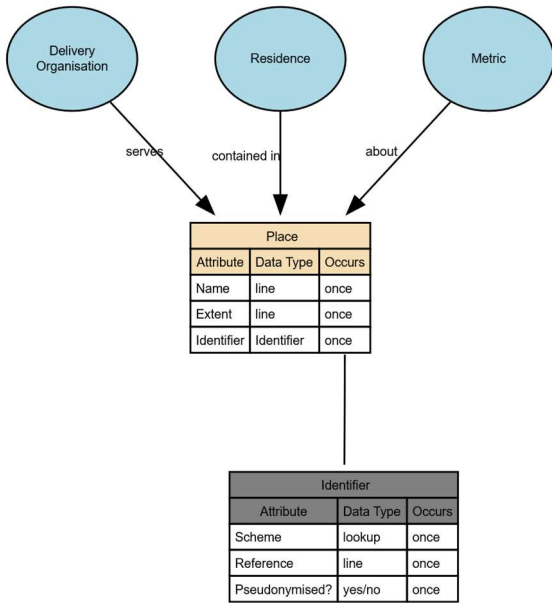
Birth Date

Name	Description	Data Type	Structure / Terminology	Occurs	Required
Date		date		once	
Estimated	To indicate that the date is an estimate. If false, or absent, then the date is not at estimate.	yes/no		once	no

Place

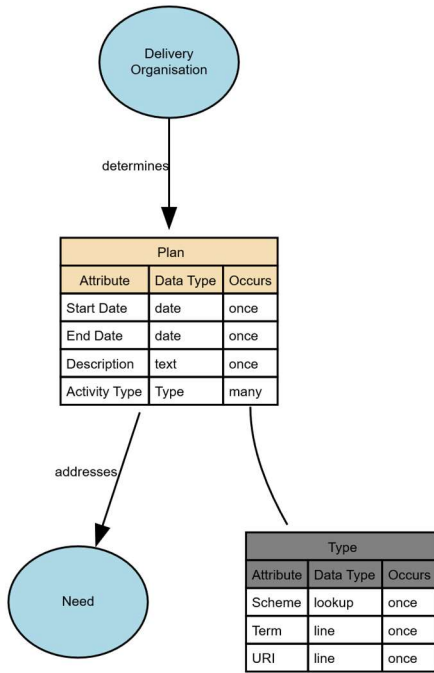
Can mean

- a one-of polygon
- a street
- a neighbourhood
- an existing statistical or administrative geography



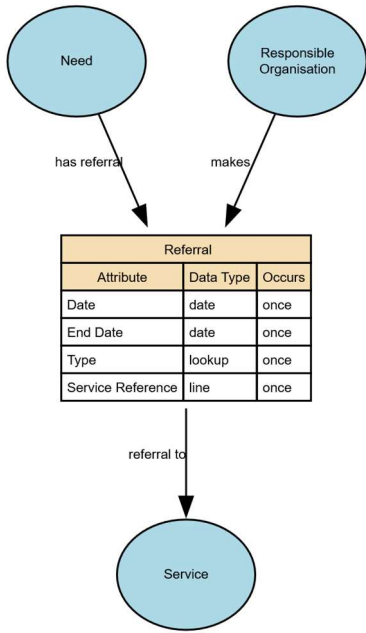
Name	Description	Data Type	Structure / Terminology	Occurs	Required
Name	The name of the Place	line		once	yes
Extent	A geographic shape expressed using an established data standard such as <ul style="list-style-type: none"> • the OGC Well-Known Text (WKT) geometry format ('POLYGON') • GeoJSON 	line		once	no
Identifier			Identifier	once	no

Plan



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Start Date	The date that the plan starts from.	date		once	
End Date	The date when the plan has ended, or is expected to end.	date		once	
Description	A description of the plan.	text		once	
Activity Type	The Activities that the Plan includes.		Type	many	

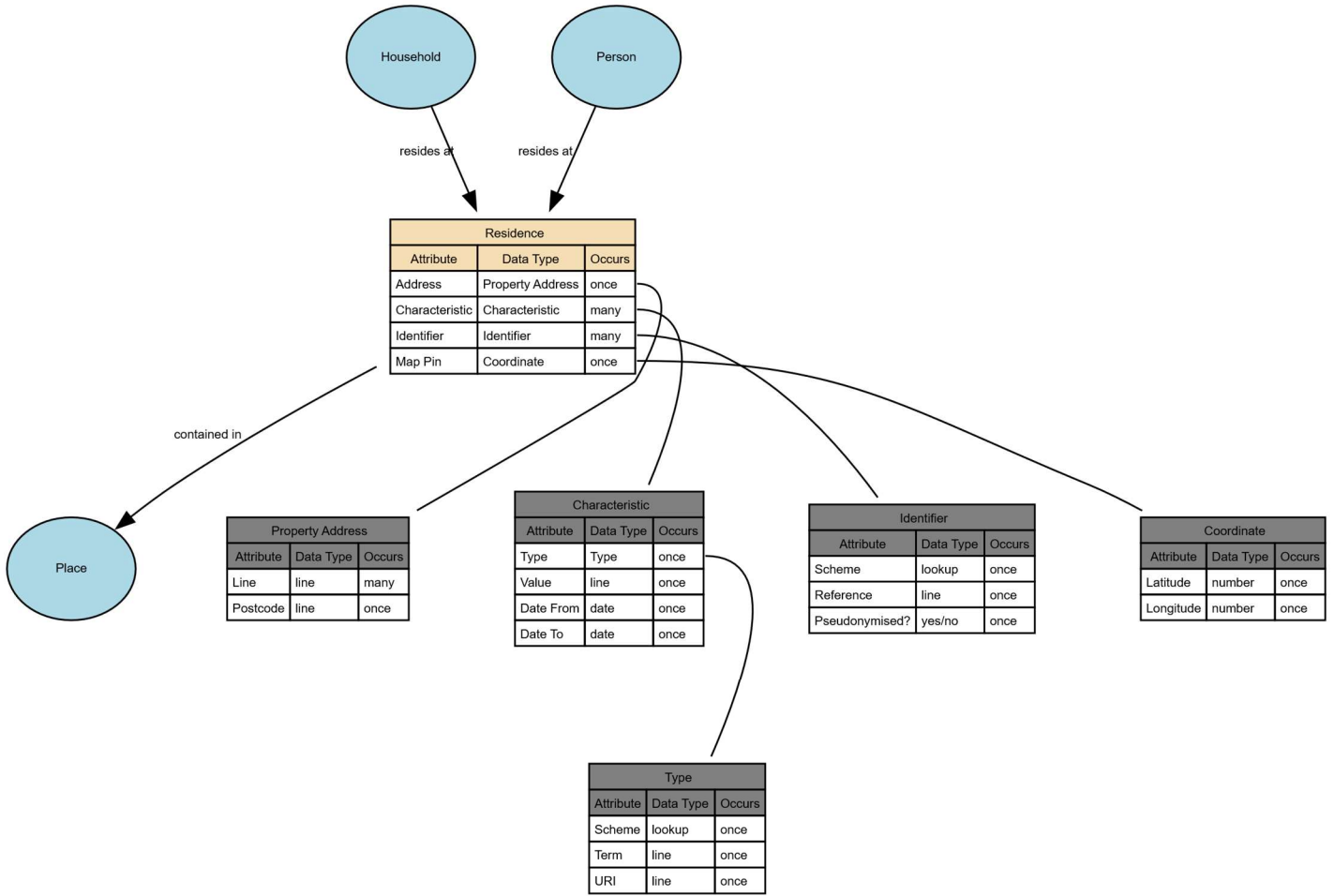
Referral



Referral		
Attribute	Data Type	Occurs
Date	date	once
End Date	date	once
Type	lookup	once
Service Reference	line	once

Name	Description	Data Type	Structure / Terminology	Occurs	Required
Date	The date that a decision was made to make the referral.	date		once	yes
End Date	The date that the referral ended.	date		once	
Type	* direct * recommended * signposted	lookup		once	yes
Service Reference	The reference assigned by the Service	line		once	

Residence



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Address			Property Address	once	
Characteristic	Information about the residence such as the number or bedrooms, condition.		Characteristic	many	
Identifier	Properties are known by Identifiers such as the UPRN from GeoPlace.		Identifier	many	
Map Pin			Coordinate	once	

Structures

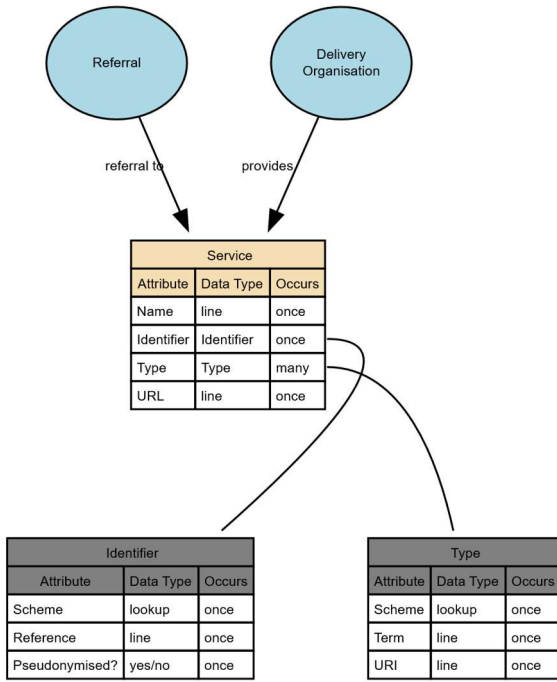
Property Address

Name	Description	Data Type	Structure / Terminology	Occurs	Required
Line		line		many	
Postcode		line		once	

Characteristics

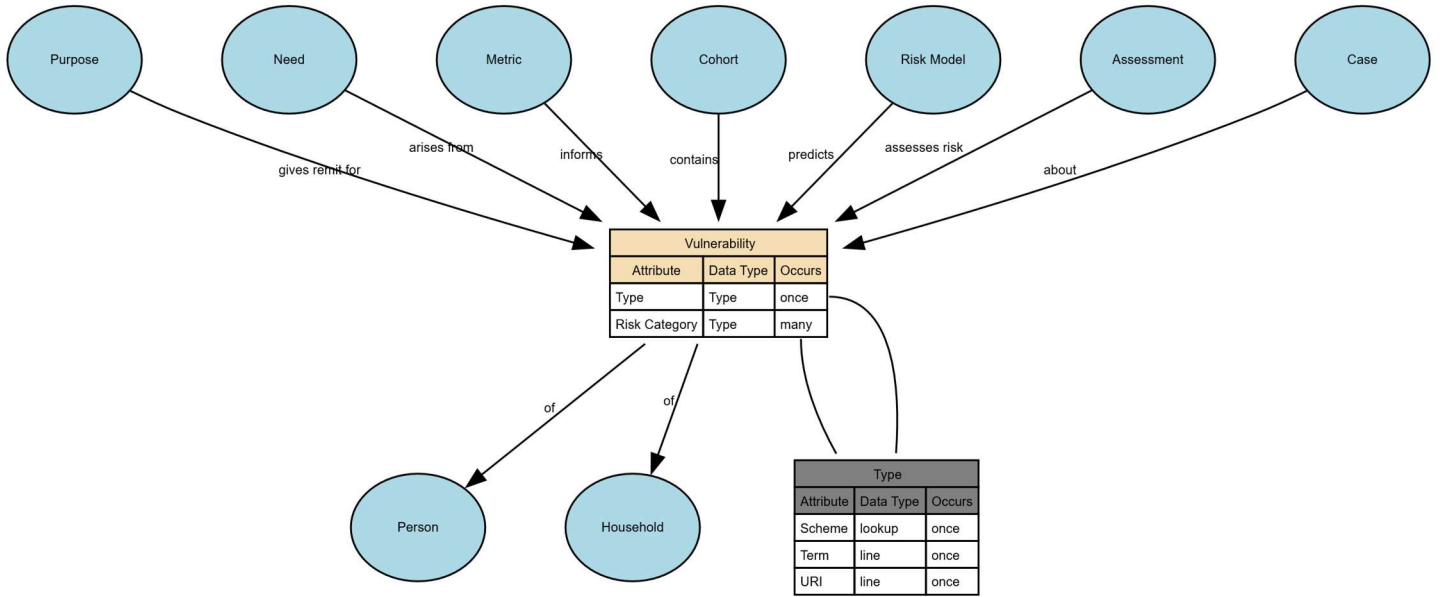
Name	Description	Data Type	Structure / Terminology	Occurs	Required
Type	The Type of the Characteristic.		Type	once	yes
Value	An optional value that quantifies the Characteristic. e.g. if the Type is 'number of bedrooms', the Value may be 3. Many Types will not need a value.	line		once	no
Date From	The date from which the Characteristic is true.	date		once	no
Date To	The date from which the Characteristic may no longer be true, or is expected to end.	date		once	no

Service



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Name	The name of the Service.	line		once	yes
Identifier	An Identifier that can be looked up, to provide more information about the Service, such as contact information, eligibility, opening times and so on.		Identifier	once	
Type	A categorisation of the type of Service		Type	many	
URL	A URL to a web page to give more information about a Service	line		once	

Vulnerability



Name	Description	Data Type	Structure / Terminology	Occurs	Required
Type			Type	once	yes
Risk Category			Type	many	

Appendix C - Data Types

Data Type	can contain	xsd data type
line	A single line of text without line breaks, typically used for names, titles, or short labels.	xsd:string
text	A block of plain text that may contain line breaks but no formatting.	xsd:string
markdown	A block of text that may include Markdown formatting for headings, lists, links, and emphasis.	xsd:string
number	A numeric value that may include decimal places.	xsd:decimal
integer	A numeric value that must not include decimal places.	xsd:integer
currency	A monetary value expressed as a decimal number, typically with two fractional digits.	xsd:decimal
date	A calendar date without a time component.	xsd:date
time	A time of day including hours and minutes, optionally including seconds and milliseconds.	xsd:time
datetime	A specific date and time, typically representing when an event occurred.	xsd:dateTime
timestamp	A precise date and time value typically used for system recording or audit purposes.	xsd:dateTime
URI	A Uniform Resource Identifier that uniquely identifies a resource using a valid URI scheme.	xsd:anyURI
URL	A web address that identifies a resource accessible via the web and includes a protocol such as http or https.	xsd:anyURI
URN	A Uniform Resource Name that uniquely identifies a resource using a URN scheme.	xsd:anyURI
yes/no	A logical value indicating true or false.	xsd:boolean
lookup	A coded value whose meaning is defined by a controlled list.	xsd:string