# B.I.R.O.

## Best Information through Regional Outcomes

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# WORK PACKAGE 4

# D4.2: XML METADATA DICTIONARY

# DOCUMENT V0.3

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# Contents

# 1. Summary

The purpose of BIRO Work Package 4 is to create an electronic directory inclusive of concept and data dictionaries for diabetes care and prevention, thereby allowing dynamically links to the clinical knowledge-base and to the systematic evaluation of health systems outcomes. This electronic dictionary and XML schema will tie in closely with the indicator development in work package 2, the minimum common dataset defined in Work Package 3, and the data dictionary documentation as deliverable 4.1.

After the creation of the data dictionary, the structures and elements of data storage and representation have been translated to an XML Schema. This process will define the structure of a relational database that will be available to all partners and which will provide mapping functionality to migrate original datasets to the common structure.

## 2. References

BIRO WP2 Clinical Review Indicator Development Results

BIRO WP3 Common Dataset

BIRO WP4 D4.1 Data Dictionary

# 3. Document Change History

| Version | Date | Author | Reason for Update |
|---|---|---|---|
| 0.1 | May 2007 | Scott Cunningham | Initial Template |
| 0.2 | July 2007 | Scott Cunningham | Revision following Cyprus meeting and completion of deliverable 4.1: Data Dictionary |
| 0.3 | October 2007 | Scott Cunningham | Revision following partner feedback |
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# 4. Methodology

BIRO Work Package 2 has created a list of Core Indicator Candidates based on the published scientific literature. Within this the scientific justification for each of the corresponding data items is included. BIRO Work Package 3: Common Dataset identifies the data items required to fulfil the requirements of the core indicator list. This has been defined on the basis of the compatibility of each parameter across each dataset. Deliverable 4.1 defined how BIRO data will be held, mapped and represented within the Data Dictionary.

The next stage of the project is to define an electronic structure for the data dictionary and for the storage and mappings of data components required for BIRO. This document clearly details the XML representation of the data dictionary and how the "meta data" will be structured within the database.

# 5. BIRO Common Dataset XML Definition

BIRODataSet.xsd (see Appendix 1) contains the clinical parameters used in BIRO. This schema simply details the BIRO data fields identified in Work Package 3, alongside their unique identifiers.

The purpose of this file is to act as a parameter reference file for the following schemas:
- ✓ ECClinicalDefinitions.xsd
- ✓ ECDataExtractDefinition.xsd
- ✓ ECDataSourceExtractDefinition.xsd

An example of how data is stored in the schema is shown below:

```xml
<xsd:simpleType name="BIRODataSet">
        <xsd:restriction base="xsd:string">
                <xsd:enumeration value="PAT_ID" id="BIRO001"/>
                <xsd:enumeration value="DS_ID" id="BIRO002"/>
                <xsd:enumeration value="TYPE_DM" id="BIRO003"/>
                .
                .
                .
                .
                <xsd:enumeration value="SELF_MON" id="BIRO044"/>
                <xsd:enumeration value="EDUCATION" id="BIRO045"/>
        </xsd:restriction>
</xsd:simpleType>
```

As new parameters are added to BIRODataSet.xsd over time, these will simply proliferate and immediately become available for use in the remaining schemas listed above and defined below.

# 6. BIRO Data Dictionary XML Schema

ECClinicalDefinitions.xsd (see Appendix 2) is the schema that maps the common dataset items to their clinical definitions. It allows the input of a full version history, including associated comments and reason for update. The definitions can also be held in an unlimited number of languages, therefore local translations to be recorded. The XML file associated with this schema will be maintained centrally and will tie in with the Work Package 2 Clinical indicators, and Work Package 3 Common Dataset document.

A version history will be available within the document to detail changes:

```xml
<VersionHistory>
        <Version>0.2</Version>
        <VersionDate>2007-05-25</VersionDate>
        <VersionComments>Amended during Cyprus meeting</VersionComments>
</VersionHistory>
```

Version: The value assigned to the version number
VersionDate: The date of the numbered document version
VersionComments: Additional freetext used to describe changes

Supported Languages can be defined using the following XML:

```xml
<SupportedLanguage>
        <Language>EN</Language>
        <TranslatorName>Scott Cunningham</TranslatorName>
        <TranslatorEmail>scott.cunningham@nhs.net</TranslatorEmail>
</SupportedLanguage>
```

Language: This refers to the language of reference using a two-digit language code
TranslatorName: This is the person responsible for the definition of the BIRO data items in the language specified
TranslatorEmail: The email address of the person responsible for the translation in the language specified.

This schema refers to BIRODataSet.xsd in order to allow only entries for those items currently valid in BIRO. These DataItem's can then be defined individually:

```xml
<DataItem>
        <FieldName>HEIGHT</FieldName>
        <DateDataItemReviewed>2007-05-25</DateDataItemReviewed>
        <DateDataItemUpdated>2007-05-25</DateDataItemUpdated>
        <DataItemDefinition>
                <Language>EN</Language>
                <ClinicalDefinition>Height in metres - measured without shoes. It is particularly important to measure regularly the height of children. In adults a single
                                                                        recording will usually be sufficient</ClinicalDefinition>
        </DataItemDefinition>
        <Units>m</Units>
        <LowerRange></LowerRange>
        <UpperRange></UpperRange>
        <DataMapping>
                <SourceUnits>cm</SourceUnits>
                <MultiplicationFactor>100</MultiplicationFactor>
                <MappingComments>Height in centimetres can be mapped to metres by multiplying by 100</MappingComments>
        </DataMapping>
        <Mandatory>false</Mandatory>
        <Validity>High</Validity>
</DataItem>
```

FieldName: The standard BIRO field name as defined in BIRODataSet.xsd
DateDataItemReviewed: Most recent date of review
DateDataItemUpdated: Most recent date of update
DataType: The data type to be applied within the database structure
DataItemDefinition
DataItemDefinition → Language: The language of the definition
DataItemDefinition → ClinicalDefinition: The clinical definition of the data item in the language specified
DataItemDefinition → LanguageComments: Any additional comments on the definition

Units: Standard BIRO-compatible units of measurement
LowerRange: The acceptable lower range of the data item
UpperRange: The acceptable upper range of the data item

DataMapping: New complex element used to record details of mappings from non-BIRO units to standard units of measurement. This allows
                any number of mappings for an individual data field
DataMapping → SourceUnits: Original units of measurement in source dataset
DataMapping → MultiplicationFactor: Value to multiply source units by to calculate BIRO-acceptable units
DataMapping → DivisionFactor: Value to divide source units by to calculate BIRO-acceptable units
DataMapping → MappingDetail: Details of any mapping that cannot be quantified mathematically
DataMapping → MappingComments: Freetext comments associated with mapping
Mandatory: A flag indicating whether the field must always be recorded
Validity: The ranking given in WP3 for the data item (High/Medium/Low)
DataItemReferences: Details of published peer reviewed literature relevant to the data item
DataItemReferences → Reference: The full reference of the article
DataItemReferences → ReferenceComments: Any freetext comments associated with the reference
DataItemComments: Any additional information associated with the data item

This schema also ties up each of the defined data items with the BIRO candidate indicators under the "OutcomeIndicator" tag. For each indicator, a reference is provided, along with details of the contributing data items and the possible algorithms (e.g. SAS, R, SQL, etc) required to calculate the indicator.

```xml
<OutcomeIndicator>
        <IndicatorReference>1</IndicatorReference>
        <DateIndicatorReviewed>2007-03-25</DateIndicatorReviewed>
        <DateIndicatorUpdated>2007-03-25</DateIndicatorUpdated>
        <IndicatorDefinition>
                <Language>EN</Language>
                <IndicatorText>Annual Incidence of Type 1 Diabetes in children between 0 - 14 years of age at diagnosis (clinical) per 100,000
                                                children</IndicatorText>
                <Numerator>Number of children between 0-14 yrs, diagnosed (clinical) within the last 12 months with type 1 diabetes mellitus</Numerator>
```

```xml
                    <Denominator>Total number of children between 0-14 yrs in the study region/country/100,000</Denominator>
                    <Source>EUDIP</Source>
                    <DatasetIssues>None</DatasetIssues>
          </IndicatorDefinition>
          <ContributingData>PAT_ID</ContributingData>
          <ContributingData>DS_ID</ContributingData>
          <ContributingData>TYPE_DM</ContributingData>
          <ContributingData>DOB</ContributingData>
          <Algorithm>
                    <ComputerLanguage>Pseudocode</ComputerLanguage>
                    <AlgorithmCalculation>Total Patients (PAT_ID) / (Data Source Denominator (DS_DENOM) / 100000)
                              With Type 1 Diabetes (TYPE_DM = 1)
                              Grouped By Year of Birth (in DOB) and Data Source ID (DS_ID)</AlgorithmCalculation>
          <AlgorithmOutput>Number of Type 1 patients/100000 grouped by year and by data source. Reference to age bandings defined in section 8 of this
                                                                                                        document.</AlgorithmOutput>
          </Algorithm>
</OutcomeIndicator>
```

IndicatorReference: The ID of the indicator that is referred to
DateIndicatorReview: Date of last review of the indicator
DateIndicatorUpdated: Date of last update of indicator
IndicatorDefinition: The full definition of the indicator
IndicatorDefinition → Language: The language that the indicator is defined in
IndicatorDefinition → IndicatorText: The full text title of the indicator
IndicatorDefinition → Numerator: The numerator used to calculate the indicator
IndicatorDefinition → Denominator: The denominator used to calculate the indicator
IndicatorDefinition → Source: The source that originally defined the indicator (e.g. EUDIP, OECD)
IndicatorDefinition → DatasetIssues: Details of known dataset compatibility issues
IndicatorDefinition → IndicatorDescriptionComments: Any other comments associated with the indicator
ContributingData: Unbounded list of data items contributing to the indicator are listed here. Each clinical outcome needs to derive its data
                                                                                                        from fields.
Algorithm: Details of algorithms used to calculate an indicator in any computing language are stored here

Algorithm → ComputerLanguage: The language used in the following algorithm (SQL, R, SAS, etc)
Algorithm → AlgorithmCalculation: Full syntax of the calculation
Algorithm → AlgorithmOutput: The specific output produced from the calculation
Algorithm → AlgorithmComment: Any addition comments about the algorithm

In addition to the data items defined above, it is possible for some data items to be calculated based on other existing parameters:

```
<CalculatedData>
        <CalculatedField>BMI</CalculatedField>
        <CalculationDataItem>HEIGHT</CalculationDataItem>
        <CalculationDataItem>WEIGHT</CalculationDataItem>
        <Calculation>WEIGHT / (HEIGHT * HEIGHT)</Calculation>
</CalculatedData>
```

CalculatedData: Data items that can be calculated based on other data items
CalculatedData → CalculatedField: The data item that can be calculated using other data items
CalculatedData → CalculationDataItem: An unbounded list of data items that contribute to the calculated data item.
CalculatedData → Calculation: The definition of how the data item can be calculated
CalculatedData → CalculationComment: Any other information about the calculated value

Within BIRO several indicators will be split based on age criteria. The following section explains how these groupings will based:

```
<AgeBandings>
      <BandingID>BAND1</BandingID>
      <LowerAge>0</LowerAge>
      <UpperAge>14</UpperAge>
</AgeBandings>
```

AgeBandings: The structure defining the age bands
AgeBandings → BandingID: A unique identified for the age band.
AgeBandings → LowerAge: The lowest age contributing to the defined age band
AgeBandings → UpperAge: The upper age contributing to the defined age band
AgeBandings → AgeBandingComment: Any additional freetext available regarding the age banding

# 7. BIRO Data Export Definition

ECDataExport.xsd (see Appendix 3) is used to define the structure for the patient data extract required from each BIRO partner. This data extract is defined with profile data that is recorded only once (e.g. data of diagnosis, type of diabetes, etc) separated from clinical results that may be recorded several times (e.g. HbA1c, blood pressure, etc). This format is flexible enough to allow any number of clinical results to be recorded although each XML file must only contain data for one patient.

Each clinical result must be recorded with an associated date of episode, alongside the following fields:
BIRO Data Item
Value of result

The full details of the export are defined within the XML Schema. The following section describes the XML elements required for each patient:

```xml
<Profile>
        <ProfileFieldName>PAT_ID</ProfileFieldName>
        <ProfileFieldValue>2222222222</ProfileFieldValue>
</Profile>
<Profile>
        <ProfileFieldName>TYPE_DM</ProfileFieldName>
        <ProfileFieldValue>2</ProfileFieldValue>
</Profile>
<Profile>
        <ProfileFieldName>SEX</ProfileFieldName>
        <ProfileFieldValue>2</ProfileFieldValue>
</Profile>
<Profile>
        <ProfileFieldName>DOB</ProfileFieldName>
        <ProfileFieldValue>1927-11-10</ProfileFieldValue>
</Profile>
<Profile>
```

```xml
            <ProfileFieldName>DT_DIAG</ProfileFieldName>
            <ProfileFieldValue>1981-06-06</ProfileFieldValue>
</Profile>
<EpisodeData>
            <EpisodeDate>2005-07-04</EpisodeDate>
            <Data>
                    <EpisodeFieldName>HBA1C</EpisodeFieldName>
                    <EpisodeFieldValue>6.5</EpisodeFieldValue>
            </Data>
            <Data>
                    <EpisodeFieldName>HEIGHT</EpisodeFieldName>
                    <EpisodeFieldValue>150</EpisodeFieldValue>
            </Data>
            <Data>
                    <EpisodeFieldName>SBP</EpisodeFieldName>
                    <EpisodeFieldValue>140</EpisodeFieldValue>
            </Data>
            <Data>
                    <EpisodeFieldName>DBP</EpisodeFieldName>
                    <EpisodeFieldValue>80</EpisodeFieldValue>
            </Data>
</EpisodeData>
```

Profile: The patient profile is non-event-based data such as surname, date of diagnosis and date of birth
Profile → ProfileFieldName: Standard BIRO field name
Profile → ProfileFieldValue: Result of the data item above
EpisodeData: Patients have events that happen chrolonogocally (patient episodes)
EpisodeData → EpisodeDate: Date of patient episode
EpisodeData → Date: Data corresponding to the patient episode
EpisodeData → Date → EpisodeFieldName: Standard BIRO field name
EpisodeData → Date → EpisodeFieldValue: Result of field specified

# 8. BIRO Data Source Export Definition

ECDataSourceExport.xsd (see Appendix 4) is used to define the profile of the clinical site providing the patient data extract. This may be an individual clinic, full regional database, national sample, etc and must be described using the category that is most appropriate. This allows a picture to be created of the data source and the associated meta-data can be used to highlight inconsistencies with local mappings to data definitions, ultimately leading to presentation on BIRO reports. The first section of this schema allows for the description of general clinic contact information.

```
<SiteHeader>
        <DateHeaderInformationChecked>2007-03-25</DateHeaderInformationChecked>
        <DS_ID>1</DS_ID>
        <DS_WEBSITE>http://www.diabetes-healthnet.ac.uk</DS_WEBSITE>
        <DS_ADDRESS_1>Diabetes Centre</DS_ADDRESS_1>
        <DS_ADDRESS_2>Level 8</DS_ADDRESS_2>
        <DS_ADDRESS_3>Ninewells Hospital</DS_ADDRESS_3>
        <DS_POST_CODE>DD1 9SY</DS_POST_CODE>
        <DS_COUNTRY>Scotland</DS_COUNTRY>
        <DS_C_CONTACT>Dr Graham Leese</DS_C_CONTACT>
        <DS_C_EMAIL>graham.leese@tuht.scot.nhs.uk</DS_C_EMAIL>
        <DS_T_CONTACT>Scott Cunningham</DS_T_CONTACT>
        <DS_T_EMAIL>scott.cunningham@nhs.net</DS_T_EMAIL>
        <HeaderComments>DARTS Dataset - Shared Patient Record for Tayside, Scotland</HeaderComments>
</SiteHeader>
```

SiteHeader: General information about the data source
SiteHeader ➔ DateHeaderInformationChecked: Date of last review
SiteHeader ➔ DS_ID: Unique centre identification number (Defined as a BIRO Clinical Site)
SiteHeader ➔ DS_WEBSITE: Internet address for Data Source
SiteHeader ➔ DS_ADDRESS_1: First line of Data Source address
SiteHeader ➔ DS_ADDRESS_2: Second line of Data Source address
SiteHeader ➔ DS_ADDRESS_3: Third line of Data Source address

SiteHeader ➔ DS_ADDRESS_4: Fourth line of Data Source address
SiteHeader ➔ DS_POST_CODE: Post Code of data source
SiteHeader ➔ DS_COUNTRY: Country in which data source exists
SiteHeader ➔ DS_C_CONTACT: Clinical contact for data source
SiteHeader ➔ DS_C_EMAIL: Email address for clinical contact
SiteHeader ➔ DS_T_CONTACT: Technical contacts for data source
SiteHeader ➔ DS_T_EMAIL: Email address for technical contact
SiteHeader ➔ HeaderComments: Comments regarding the header information

The following section allows the storage of data regarding clinic demography.

```
<SiteProfile>
        <DateProfileInformationChecked>2007-03-25</DateProfileInformationChecked>
        <DS_TYPE>4</DS_TYPE>
        <DS_DENOM>385000</DS_DENOM>
        <DS_AREA>1</DS_AREA>
        <DS_BEDS>1</DS_BEDS>
        <DS_PHYSICIANS>1</DS_PHYSICIANS>
        <DS_DIABETOLOGISTS>1</DS_DIABETOLOGISTS>
        <DS_DOCTORS>1</DS_DOCTORS>
        <DS_DSN>1</DS_DSN>
        <DS_PROGS>1</DS_PROGS>
</SiteProfile>
```

SiteProfile: Details regarding the profile of the data source
SiteProfile ➔ DateProfileInformationChecked:
SiteProfile ➔ DS_TYPE: The type of source from which data has been extracted
SiteProfile ➔ DS_DENOM: Current data source population (with or without diabetes)
SiteProfile ➔ DS_AREA: The total population of patients with known diabetes in the catchment area of the clinic
SiteProfile ➔ DS_BEDS: Total hospital beds within data source geographical area - not separated by category
SiteProfile ➔ DS_PHYSICIANS: Physicians within data source geographical area. National statistics can provide information on this
indicator

SiteProfile ➜ DS_DIABETOLOGISTS: Diabetologists within data source geographical area. Data should come from national Specialist Registers

SiteProfile ➜ DS_DOCTORS: Number of doctors who regularly take care of diabetic patients in diabetes clinics in primary or secondary care within data source geographical area

SiteProfile ➜ DS_DSN: Specialist diabetes nurses within data source geographical area

SiteProfile ➜ DS_PROGS: Number of disease management programmes in data source geographical area. Availability of a DMP influences the level of structured and evidence based treatment

SiteProfile ➜ DS_ProfileComments: Additional comments regarding the site profile

Most importantly, this schema also allows for data to be held regarding each data items in the BIRO dataset in terms of its quality and consistency with the BIRO definition.

```xml
<FieldExportProfiles>
        <FieldName>DT_DIAG</FieldName>
        <DateStatusLastReviewed>2007-03-25</DateStatusLastReviewed>
        <Recorded>true</Recorded>
        <Consistency>High</Consistency>
        <Completeness>95%</Completeness>
        <Mandatory>false</Mandatory>
        <Routine>true</Routine>
        <QualityScore>High</QualityScore>
</FieldExportProfiles>
```

FieldExportProfiles: Metadata regarding the BIROdata items from the specified data source

FieldExportProfiles ➜ FieldName: The BIRO data items that is being described

FieldExportProfiles ➜ DateStatusLastReviewed: Date of last review

FieldExportProfiles ➜ Recorded: Whether or not the data source records this data item

FieldExportProfiles ➜ Consistency: An indicator detailing how well the source data complies with the BIRO definition

FieldExportProfiles ➜ Completeness: A percentage indicating how much of the data item can be identified

FieldExportProfiles ➜ Mandatory: Whether or not the recording of the data item is mandatory at source

FieldExportProfiles ➜ Routine: Whether or not the recording of the data item is routine at source

FieldExportProfiles → QualityScore: An objective overall score describing how well the source can meet the data requirements
FieldExportProfiles → FieldExportComments: Any additional free text comments

# Appendix 1: BIRODataSet.xsd v0.2

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema" version="0.2">
    <xsd:annotation>
        <xsd:documentation>Created by Scott Cunningham, 2007-03-23, version 0.1</xsd:documentation>
        <xsd:documentation>Modified by Scott Cunningham, 2007-07-23, version 0.2</xsd:documentation>
        <xsd:documentation>Revisions following BIRO Meeting in Cyprus</xsd:documentation>
    </xsd:annotation>
    <xsd:simpleType name="BIRODataSet">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="PAT_ID" id="BIRO001"/>
            <xsd:enumeration value="DS_ID" id="BIRO002"/>
            <xsd:enumeration value="TYPE_DM" id="BIRO003"/>
            <xsd:enumeration value="SEX" id="BIRO004"/>
            <xsd:enumeration value="DOB" id="BIRO005"/>
            <xsd:enumeration value="DT_DIAG" id="BIRO006"/>
            <xsd:enumeration value="EPI_DATE" id="BIRO007"/>
            <xsd:enumeration value="SMOK_STAT" id="BIRO008"/>
            <xsd:enumeration value="CIGS_DAY" id="BIRO009"/>
            <xsd:enumeration value="ALC_STAT" id="BIRO047"/>
            <xsd:enumeration value="ALCOHOL" id="BIRO010"/>
            <xsd:enumeration value="WEIGHT" id="BIRO011"/>
            <xsd:enumeration value="HEIGHT" id="BIRO012"/>
            <xsd:enumeration value="BMI" id="BIRO013"/>
            <xsd:enumeration value="SBP" id="BIRO014"/>
            <xsd:enumeration value="DBP" id="BIRO015"/>
            <xsd:enumeration value="HBA1C" id="BIRO016"/>
            <xsd:enumeration value="CREAT" id="BIRO017"/>
            <xsd:enumeration value="MA_TEST" id="BIRO018"/>
            <xsd:enumeration value="CHOL" id="BIRO019"/>
            <xsd:enumeration value="HDL" id="BIRO020"/>
            <xsd:enumeration value="LDL" id="BIRO046"/>
            <xsd:enumeration value="TG" id="BIRO021"/>
            <xsd:enumeration value="RETINAL_EXAM" id="BIRO022"/>
            <xsd:enumeration value="RETINA" id="BIRO023"/>
            <xsd:enumeration value="MACULA" id="BIRO024"/>
            <xsd:enumeration value="FOOT_EXAM" id="BIRO025"/>
            <xsd:enumeration value="PULSES" id="BIRO026"/>
            <xsd:enumeration value="FTSENS" id="BIRO027"/>
            <xsd:enumeration value="ESRF" id="BIRO028"/>
            <xsd:enumeration value="DIALYSIS" id="BIRO029"/>
```

```xml
                    <xsd:enumeration value="TRANSPLANT" id="BIRO030"/>
                    <xsd:enumeration value="STROKE" id="BIRO031"/>
                    <xsd:enumeration value="ULCER" id="BIRO032"/>
                    <xsd:enumeration value="MI" id="BIRO033"/>
                    <xsd:enumeration value="LASER" id="BIRO034"/>
                    <xsd:enumeration value="HYPERTENSION" id="BIRO035"/>
                    <xsd:enumeration value="BLIND" id="BIRO036"/>
                    <xsd:enumeration value="AMPUT" id="BIRO037"/>
                    <xsd:enumeration value="HYPERT_MED" id="BIRO038"/>
                    <xsd:enumeration value="DRUG_THERAPY" id="BIRO039"/>
                    <xsd:enumeration value="ORAL_THERAPY" id="BIRO040"/>
                    <xsd:enumeration value="PUMP_THERAPY" id="BIRO041"/>
                    <xsd:enumeration value="NASAL_THERAPY" id="BIRO042"/>
                    <xsd:enumeration value="INJECTIONS" id="BIRO043"/>
                    <xsd:enumeration value="SELF_MON" id="BIRO044"/>
                    <xsd:enumeration value="EDUCATION" id="BIRO045"/>
                </xsd:restriction>
            </xsd:simpleType>
</xsd:schema>
```

# Appendix 2: ECClinicalDefinitions.xsd v0.5

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:include schemaLocation="BIRODataSet.xsd"/>
  <xsd:element name="ECClinicalDefinitions">
    <xsd:annotation>
      <xsd:documentation>Created by Douglas Boyle, 2006-02-16</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-03-25, version 0.2</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-05-24, version 0.3 </xsd:documentation>
      <xsd:documentation>Removal of duplicate element tags</xsd:documentation>
      <xsd:documentation>Addition of elements to define mappings to BIRO dataset units</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-07-24, version 0.4 </xsd:documentation>
      <xsd:documentation>Amended after Data Dictionary (D4.1) completion</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-10-16, version 0.5 </xsd:documentation>
      <xsd:documentation>Amended after partner feedback</xsd:documentation>
    </xsd:annotation>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="VersionHistory" maxOccurs="unbounded">
          <xsd:annotation>
            <xsd:documentation>A log is maintained of all version modifications to the BIRO clinical definitions</xsd:documentation>
          </xsd:annotation>
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="Version" type="xsd:string"/>
              <xsd:element name="VersionDate" type="xsd:date"/>
              <xsd:element name="VersionComments" type="xsd:string">
                <xsd:annotation>
                  <xsd:documentation>The reason for the version update is mandatory</xsd:documentation>
                </xsd:annotation>
              </xsd:element>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="SupportedLanguage" maxOccurs="unbounded">
          <xsd:annotation>
            <xsd:documentation>The languages supported by the dictionary are listed for reference purposes</xsd:documentation>
          </xsd:annotation>
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="Language" type="xsd:string"/>
```

```xml
            <xsd:element name="TranslatorName" type="xsd:string"/>
            <xsd:element name="TranslatorEmail" type="xsd:string"/>
          </xsd:sequence>
        </xsd:complexType>
      </xsd:element>
      <xsd:element name="DataItem" maxOccurs="unbounded">
        <xsd:annotation>
          <xsd:documentation>Every data item collected for the purposes of BIRO is listed here</xsd:documentation>
        </xsd:annotation>
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="FieldName" type="BIRODataSet">
              <xsd:annotation>
                <xsd:documentation>Field names match with the names found in the BIRODataSet schema </xsd:documentation>
              </xsd:annotation>
            </xsd:element>
            <xsd:element name="DateDataItemReviewed" type="xsd:date"/>
            <xsd:element name="DateDataItemUpdated" type="xsd:date"/>
            <xsd:element name="DataType" type="xsd:string" minOccurs="0"/>
            <xsd:element name="DataItemDefinition" maxOccurs="unbounded">
              <xsd:annotation>
                <xsd:documentation>Definition of the collected data item - in multiple languages</xsd:documentation>
              </xsd:annotation>
              <xsd:complexType>
                <xsd:sequence>
                  <xsd:element name="Language" type="xsd:string"/>
                  <xsd:element name="ClinicalDefinition" type="xsd:string"/>
                  <xsd:element name="LanguageComments" type="xsd:string" minOccurs="0"/>
                </xsd:sequence>
              </xsd:complexType>
            </xsd:element>
            <xsd:element name="Units" type="xsd:string" minOccurs="0">
              <xsd:annotation>
                <xsd:documentation>Units of measurement</xsd:documentation>
              </xsd:annotation>
            </xsd:element>
            <xsd:element name="LowerRange" type="xsd:string" minOccurs="0">
              <xsd:annotation>
                <xsd:documentation>Acceptable lower range value of data item</xsd:documentation>
              </xsd:annotation>
            </xsd:element>
            <xsd:element name="UpperRange" type="xsd:string" minOccurs="0">
              <xsd:annotation>
                <xsd:documentation>Acceptable upper range value of data item</xsd:documentation>
              </xsd:annotation>
```

```xml
        </xsd:element>
        <xsd:element name="DataMapping" minOccurs="0" maxOccurs="unbounded">
          <xsd:annotation>
            <xsd:documentation>Details used calculate mapping to BIRO data item units of measurement</xsd:documentation>
          </xsd:annotation>
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="SourceUnits" type="xsd:string" minOccurs="0"/>
              <xsd:element name="MultiplicationFactor" type="xsd:string" minOccurs="0"/>
              <xsd:element name="DivisionFactor" type="xsd:string" minOccurs="0"/>
              <xsd:element name="MappingDetail" type="xsd:string" minOccurs="0"/>
              <xsd:element name="MappingComments" type="xsd:string" minOccurs="0"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="Mandatory" type="xsd:boolean">
          <xsd:annotation>
            <xsd:documentation>Is this a mandatory field?</xsd:documentation>
          </xsd:annotation>
        </xsd:element>
        <xsd:element name="Validity" type="Validity"/>
        <xsd:element name="DataItemReferences" minOccurs="0" maxOccurs="unbounded">
          <xsd:annotation>
            <xsd:documentation>All data items have been identified based on references detailed in WP2.</xsd:documentation>
          </xsd:annotation>
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="Reference" type="xsd:string"/>
              <xsd:element name="ReferenceComments" type="xsd:string"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="DataItemComments" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="OutcomeIndicator" maxOccurs="unbounded">
    <xsd:annotation>
      <xsd:documentation>Every outcome or process indicator used by BIRO along with the affected fields and algorithms used are recorded here</xsd:documentation>
    </xsd:annotation>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="IndicatorReference" type="xsd:string"/>
        <xsd:element name="DateIndicatorReviewed" type="xsd:date"/>
        <xsd:element name="DateIndicatorUpdated" type="xsd:date"/>
```

```xsd
<xsd:element name="IndicatorDefinition" maxOccurs="unbounded">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="Language" type="xsd:string"/>
      <xsd:element name="IndicatorText" type="xsd:string"/>
      <xsd:element name="Numerator" type="xsd:string"/>
      <xsd:element name="Denominator" type="xsd:string"/>
      <xsd:element name="Source" type="xsd:string"/>
      <xsd:element name="DatasetIssues" type="xsd:string"/>
      <xsd:element name="IndicatorDescriptionComments" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="ContributingData"  type="BIRODataSet" maxOccurs="unbounded">
  <xsd:annotation>
    <xsd:documentation>Each clinical outcome needs to derive its data from fields. The fields used in the calculation are listed here.</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="Algorithm">
  <xsd:annotation>
    <xsd:documentation>The algorithm used to calculate the clinical outcome is stored here. This could be SQL Code, a SAS function or other </xsd:documentation>
  </xsd:annotation>
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="ComputerLanguage"/>
      <xsd:element name="AlgorithmCalculation" type="xsd:string"/>
      <xsd:element name="AlgorithmOutput" type="xsd:string"/>
      <xsd:element name="AlgorithmComment" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
      </xsd:sequence>
    </xsd:complexType>
</xsd:element>
<xsd:element name="CalculatedData">
  <xsd:annotation>
    <xsd:documentation>Details data items that can be calculated from one or more independent data items</xsd:documentation>
  </xsd:annotation>
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="CalculatedField" type="BIRODataSet"/>
      <xsd:element name="CalculationDataItem"  type="BIRODataSet" maxOccurs="unbounded">
        <xsd:annotation>
          <xsd:documentation>Each clinical outcome needs to derive its data from fields. The fields used in the calculation are listed here.</xsd:documentation>
        </xsd:annotation>
```

```xml
          </xsd:element>
          <xsd:element name="Calculation" type="xsd:string"/>
          <xsd:element name="CalculationComment" type="xsd:string" minOccurs="0"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
    <xsd:element name="AgeBandings">
      <xsd:annotation>
        <xsd:documentation>Defined the agreed age groupings to be used in BIRO</xsd:documentation>
      </xsd:annotation>
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="BandingID" type="xsd:string"/>
          <xsd:element name="LowerAge" type="xsd:string" minOccurs="0"/>
          <xsd:element name="UpperAge" type="xsd:string" minOccurs="0"/>
          <xsd:element name="AgeBandingComment" type="xsd:string" minOccurs="0"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
</xsd:element>
<xsd:simpleType name="Validity">
  <xsd:restriction base="xsd:string">
    <xsd:annotation>
      <xsd:documentation>The validity weighting of the data item as defined in WP3</xsd:documentation>
    </xsd:annotation>
    <xsd:enumeration value="Low">
      <xsd:annotation>
        <xsd:documentation>Inconsistencies across more than 1 dataset</xsd:documentation>
      </xsd:annotation>
    </xsd:enumeration>
    <xsd:enumeration value="Medium">
      <xsd:annotation>
        <xsd:documentation>Inconsistencies in 1 dataset during comparison</xsd:documentation>
      </xsd:annotation>
    </xsd:enumeration>
    <xsd:enumeration value="High">
      <xsd:annotation>
        <xsd:documentation>High Validity items are those which are consistent across all analysed datasets</xsd:documentation>
      </xsd:annotation>
    </xsd:enumeration>
  </xsd:restriction>
</xsd:simpleType>
</xsd:schema>
```

# Appendix 3: ECDataExport.xsd v0.3

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema" version="0.4">
  <xsd:include schemaLocation="BIRODataSet.xsd"/>
  <xsd:element name="ECDataExport">
    <xsd:annotation>
      <xsd:documentation>Created by Douglas Boyle, 2006-02-16</xsd:documentation>
      <xsd:documentation>Each participating client database / system / clinic / data source has a definition</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-03-23, version 0.2</xsd:documentation>
      <xsd:documentation>Split data source data from clinical data</xsd:documentation>
      <xsd:documentation>Added extra data fields existing in BIRO WP3 dataset</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-05-24, version 0.3</xsd:documentation>
      <xsd:documentation>Removal of duplicate element names</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-07-24, version 0.4</xsd:documentation>
      <xsd:documentation>Updated during Data Dictionary developments</xsd:documentation>
    </xsd:annotation>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="Patient" maxOccurs="1">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="Profile" maxOccurs="unbounded">
                <xsd:annotation>
                  <xsd:documentation>The patient profile is non-event-based data such as surname, date of diagnosis and date of birth</xsd:documentation>
                </xsd:annotation>
                <xsd:complexType>
                  <xsd:sequence>
                    <xsd:element name="ProfileFieldName" type="BIRODataSet">
                      <xsd:annotation>
                        <xsd:documentation>Standard BIRO field name</xsd:documentation>
                      </xsd:annotation>
                    </xsd:element>
                    <xsd:element name="ProfileFieldValue" type="xsd:string">
                      <xsd:annotation>
                        <xsd:documentation>Field result</xsd:documentation>
                      </xsd:annotation>
                    </xsd:element>
                  </xsd:sequence>
                </xsd:complexType>
              </xsd:element>
              <xsd:element name="EpisodeData" maxOccurs="unbounded">
```

```xml
<xsd:annotation>
    <xsd:documentation>Patients have events that happen chrolonogocally (patient episodes)</xsd:documentation>
</xsd:annotation>
<xsd:complexType>
    <xsd:sequence>
        <xsd:element name="EpisodeDate" type="xsd:date">
            <xsd:annotation>
                <xsd:documentation>Date of the patient episode</xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="Data" maxOccurs="unbounded">
            <xsd:annotation>
                <xsd:documentation>Data corresponding to the patient episode</xsd:documentation>
            </xsd:annotation>
            <xsd:complexType>
                <xsd:sequence>
                    <xsd:element name="EpisodeFieldName" type="BIRODataSet">
                        <xsd:annotation>
                            <xsd:documentation>Standard BIRO field name</xsd:documentation>
                        </xsd:annotation>
                    </xsd:element>
                    <xsd:element name="EpisodeFieldValue" type="xsd:string">
                        <xsd:annotation>
                            <xsd:documentation>Field result</xsd:documentation>
                        </xsd:annotation>
                    </xsd:element>
                </xsd:sequence>
            </xsd:complexType>
        </xsd:element>
    </xsd:sequence>
</xsd:complexType>
</xsd:element>
</xsd:sequence>
</xsd:complexType>
</xsd:element>
</xsd:schema>
```

# Appendix 4: ECDataSourceExport.xsd v0.4

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema" version="0.4">
  <xsd:include schemaLocation="BIRODataSet.xsd"/>
  <xsd:element name="ECDataSourceExport">
    <xsd:annotation>
      <xsd:documentation>Created by Douglas Boyle, 2006-02-16</xsd:documentation>
      <xsd:documentation>Each participating client database / system / clinic has a definition</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-03-23, version 0.2</xsd:documentation>
      <xsd:documentation>Split data source data from clinical data</xsd:documentation>
      <xsd:documentation>Added extra data fields existing in BIRO WP3 dataset</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-05-24, version 0.3</xsd:documentation>
      <xsd:documentation>Removal of duplicate element names</xsd:documentation>
      <xsd:documentation>Amended by Scott Cunningham, 2007-07-24, version 0.4</xsd:documentation>
      <xsd:documentation>Updated during data dictionary development</xsd:documentation>
    </xsd:annotation>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="SiteHeader">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="DateHeaderInformationChecked" type="xsd:date"/>
              <xsd:element name="DS_ID" type="DataSource" id="BIRO002">
                <xsd:annotation>
                  <xsd:documentation>Unique centre identification number (Defined as a BIRO Clinical Site)</xsd:documentation>
                </xsd:annotation>
              </xsd:element>
              <xsd:element name="DS_WEBSITE" type="xsd:string" id="BIRO106" minOccurs="0">
                <xsd:annotation>
                  <xsd:documentation>Internet address for Data Source</xsd:documentation>
                </xsd:annotation>
              </xsd:element>
              <xsd:element name="DS_ADDRESS_1" type="xsd:string" id="BIRO107">
                <xsd:annotation>
                  <xsd:documentation>First line of Data Source address</xsd:documentation>
                </xsd:annotation>
              </xsd:element>
              <xsd:element name="DS_ADDRESS_2" type="xsd:string" id="BIRO108">
                <xsd:annotation>
                  <xsd:documentation>Second line of Data Source address</xsd:documentation>
                </xsd:annotation>
```

```xml
      </xsd:element>
      <xsd:element name="DS_ADDRESS_3" type="xsd:string" id="BIRO109" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>Third line of Data Source address</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_ADDRESS_4" type="xsd:string" id="BIRO110" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>Fourth line of Data Source address</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_POST_CODE" type="xsd:string" id="BIRO111" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>Post Code of Data Source</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_COUNTRY" type="xsd:string" id="BIRO101">
        <xsd:annotation>
          <xsd:documentation>The country from which the clinical data originates</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_C_CONTACT" type="xsd:string" id="BIRO112">
        <xsd:annotation>
          <xsd:documentation>Clinical representative from Data Source</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_C_EMAIL" type="xsd:string" id="BIRO113">
        <xsd:annotation>
          <xsd:documentation>Email address of Data Source clinical representative</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_T_CONTACT" type="xsd:string" id="BIRO114">
        <xsd:annotation>
          <xsd:documentation>Technical representative from Data Source</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_T_EMAIL" type="xsd:string" id="BIRO115">
        <xsd:annotation>
          <xsd:documentation>Email address of Data Source technical representative</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="HeaderComments" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
```

```xml
<xsd:element name="SiteProfile">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="DateProfileInformationChecked" type="xsd:date"/>
      <xsd:element name="DS_TYPE" type="SiteType" id="BIRO102"/>
      <xsd:element name="DS_DENOM" type="xsd:positiveInteger" id="BIRO104">
        <xsd:annotation>
          <xsd:documentation>Current data source population (with or without diabetes)</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_AREA" type="xsd:positiveInteger" id="BIRO105">
        <xsd:annotation>
          <xsd:documentation>The total population of patients with known diabetes in the catchment area of the clinic</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_BEDS" type="xsd:positiveInteger" id="BIRO116">
        <xsd:annotation>
          <xsd:documentation>Total hospital beds within data source geographical area - not separated by category</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_PHYSICIANS" type="xsd:positiveInteger" id="BIRO117">
        <xsd:annotation>
          <xsd:documentation>Physicians within data source geographical area. National statistics can provide information on this indicator</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_DIABETOLOGISTS" type="xsd:positiveInteger" id="BIRO118">
        <xsd:annotation>
          <xsd:documentation>Diabetologists within data source geographical area. Data should come from national Specialist Registers</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_DOCTORS" type="xsd:positiveInteger" id="BIRO119">
        <xsd:annotation>
          <xsd:documentation>Number of doctors who regularly take care of diabetic patients in diabetes clinics in primary or secondary care within data source geographical area</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_DSN" type="xsd:positiveInteger" id="BIRO120">
        <xsd:annotation>
          <xsd:documentation>Specialist diabetes nurses within data source geographical area</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="DS_PROGS" type="xsd:positiveInteger" id="BIRO121">
        <xsd:annotation>
          <xsd:documentation>Number of disease management programmes in data source geographical area. Availability of a DMP influences the level of structured and evidence based treatment</xsd:documentation>
```

```xml
          </xsd:annotation>
        </xsd:element>
        <xsd:element name="ProfileComments" type="xsd:string" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <!--FieldProfiles-->
  <xsd:element name="FieldExportProfiles" maxOccurs="unbounded">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="FieldName" type="BIRODataSet"/>
        <xsd:element name="DateStatusLastReviewed" type="xsd:date">
          <xsd:annotation>
            <xsd:documentation>When were the field recording attributes below last reviewed?</xsd:documentation>
          </xsd:annotation>
        </xsd:element>
        <xsd:element name="Recorded" type="xsd:boolean">
          <xsd:annotation>
            <xsd:documentation>Is the field recorded?</xsd:documentation>
          </xsd:annotation>
        </xsd:element>
        <xsd:element name="Consistency" type="Ranking">
          <xsd:annotation>
            <xsd:documentation>Is the field consistent with the BIRO definition?</xsd:documentation>
          </xsd:annotation>
        </xsd:element>
        <xsd:element name="Completeness" type="Percent">
          <xsd:annotation>
            <xsd:documentation>Is the field recording complete? As defined in Data Dictionary documentation (Low/Medium/High)</xsd:documentation>
          </xsd:annotation>
        </xsd:element>
        <xsd:element name="Mandatory" type="xsd:boolean">
          <xsd:annotation>
            <xsd:documentation>Is the field mandatory?</xsd:documentation>
          </xsd:annotation>
        </xsd:element>
        <xsd:element name="Routine" type="xsd:boolean">
          <xsd:annotation>
            <xsd:documentation>Is the field routinely collected?</xsd:documentation>
          </xsd:annotation>
        </xsd:element>
        <xsd:element name="QualityScore" type="Ranking">
          <xsd:annotation>
            <xsd:documentation>Quality score as defined in Data Dictionary documentation (Low/Medium/High)?</xsd:documentation>
          </xsd:annotation>
```

```xml
      </xsd:element>
      <xsd:element name="FieldExportComments" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<!--simple types-->
<xsd:simpleType name="DataSource">
  <xsd:restriction base="xsd:positiveInteger">
    <xsd:enumeration value="1">
      <xsd:annotation>
        <xsd:documentation>DARTS Dataset, Tayside, Scotland</xsd:documentation>
      </xsd:annotation>
    </xsd:enumeration>
    <xsd:enumeration value="2">
      <xsd:annotation>
        <xsd:documentation>AMD Dataset, Umbria, Italy</xsd:documentation>
      </xsd:annotation>
    </xsd:enumeration>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="Ranking">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Low"/>
    <xsd:enumeration value="Medium"/>
    <xsd:enumeration value="High"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="SiteType">
  <xsd:restriction base="xsd:positiveInteger">
    <xsd:annotation>
      <xsd:documentation>The type of source from which data has been extracted</xsd:documentation>
    </xsd:annotation>
    <xsd:enumeration value="1">
      <xsd:annotation>
        <xsd:documentation>GP</xsd:documentation>
      </xsd:annotation>
    </xsd:enumeration>
    <xsd:enumeration value="2">
      <xsd:annotation>
        <xsd:documentation>Hospital Clinic (Internal Medicine)</xsd:documentation>
      </xsd:annotation>
    </xsd:enumeration>
```

```xml
<xsd:enumeration value="3">
   <xsd:annotation>
      <xsd:documentation>Hospital Clinic (Diabetes)</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value="4">
   <xsd:annotation>
      <xsd:documentation>Regional Shared-data Register</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value="5">
   <xsd:annotation>
      <xsd:documentation>Regional Primary Care Project</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value="6">
   <xsd:annotation>
      <xsd:documentation>Disease Management Programme</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value="7">
   <xsd:annotation>
      <xsd:documentation>Hospital Discharge Information</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value="8">
   <xsd:annotation>
      <xsd:documentation>Insurance Programme</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value="9">
   <xsd:annotation>
      <xsd:documentation>Retinal Screening Programme</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value="10">
   <xsd:annotation>
      <xsd:documentation>Diabetes Specialist Nurse Clinic</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value="11">
   <xsd:annotation>
      <xsd:documentation>National Data – Complete</xsd:documentation>
   </xsd:annotation>
</xsd:enumeration>
```

```xml
              <xsd:enumeration value="12">
                <xsd:annotation>
                  <xsd:documentation>National Data – Sample</xsd:documentation>
                </xsd:annotation>
              </xsd:enumeration>
              <xsd:enumeration value="13">
                <xsd:annotation>
                  <xsd:documentation>Regional Data – Sample</xsd:documentation>
                </xsd:annotation>
              </xsd:enumeration>
          </xsd:restriction>
        </xsd:simpleType>
        <xsd:simpleType name="Percent">
          <xsd:restriction base="xsd:string">
              <xsd:maxLength value="8"/>
              <xsd:pattern value="[+\-]?([0-9]+|[0-9]+.[0-9]*|[0-9]*.[0-9]+)%"/>
          </xsd:restriction>
        </xsd:simpleType>
    </xsd:schema>
```