



University of Cyprus

ΚΟΙΝΟΠΡΑΞΙΑ: ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΥΠΡΟΥ ΚΑΙ ΥΠΟΥΡΓΕΙΟ ΥΓΕΙΑΣ



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Abstract

The objective of this document is to present a proposal on how to specialise the common set of Key Performance Indicators (KPIs) for progress and performance monitoring defined in the CEF Monitoring Framework for the eHealth DSI.

The CEF Monitoring and Reporting framework defines the structure for the monitoring and reporting activities carried out by the CEF Project and Architecture Office (PAO). The CEF Monitoring and Reporting framework defines a set of activities carried out by the CEF PAO in collaboration with the monitored DSIs. These activities are in place to ensure the systematic and continuous collection of data for transparency purposes and informed decision-making.

To monitor the performance of the Cyprus' National Contact Point's operations we focus on KPI-1: Uptake and KPI-3: Uptime based on the latest updates of 2020, as documented in eHDSI Monitoring Framework (KPI) eHealth DSI Operations¹.

For a time-interval corresponding to a Quarter of the year, we will collect all the KPIs data as referenced in Section 2 and we will provide them to the eHDSI support services.

¹ <https://ec.europa.eu/cefdigital/wiki/pages/viewpage.action?pageId=35210477>

Table of Contents

	ΚΟΙΝΟΠΡΑΞΙΑ: ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΥΠΡΟΥ ΚΑΙ ΥΠΟΥΡΓΕΙΟ ΥΓΕΙΑΣ	1
1	Introduction	6
2	Data Collection.....	6
2.1	KPI-1: Uptake	6
2.1.1	KPI-1.1 Number of Countries with Operational NCPeH.....	8
2.1.2	KPI-1.2 Number of transactions between Countries	8
2.1.3	KPI-1.3 Number of ePrescriptions exchanged	9
2.1.4	KPI-1.4 Number of eDispensations exchanged.....	10
2.1.5	KPI-1.5 Number of Patient Summaries exchanges	10
2.1.6	KPI-1.6 Number of Dispensation Discard operations performed	11
2.1.7	KPI-1.7 Services Supported by CY	11
2.1.8	KPI-1.8 Total Percentages	11
2.1.9	KPI-1.9 Number of Citizens who can be benefited or not	11
2.1.10	KPI-1.10 Number of distinct citizens across Europe and nationally who have used the ePrescription service.....	11
2.1.11	KPI-1.11 Number of distinct citizens across Europe and nationally who have used the Patient Summary service	12
2.2	KPI-2: Quality	13
2.2.1	KPI-2.1 Citizens awareness about eHDSI services.....	13
2.2.2	KPI-2.2 Citizens perception of eHDSI services value in their lives	13
2.2.3	KPI-2.3 Health Professionals awareness eHDSI services.....	13
2.2.4	KPI-2.4 Health Professionals satisfaction from use of eHDSI.....	13
2.3	KPI-3: Uptime	14
2.3.1	KPI-3.4: NCPeH uptime per country.....	14
3	KPIs Reporting.....	15

1 Introduction

The objective of this annex is to document how we capture and handle in NCPeH CY the common set of Key Performance Indicators (KPIs) for progress and performance monitoring defined in the CEF Monitoring Framework² for the eHealth DSI in eHDSI monitoring and reporting framework v1.4³ document.

2 Data Collection

To monitor the performance of the National Contact Point's operations we focus on KPI-1: Uptake and KPI-3: Uptime.

2.1 KPI-1: Uptake

As NCPeH CY we are using the eADC (eAutomatic Data Collector) component to log extract the needed information regarding KPI-1. On the top of that, we set up a mechanism to gather the necessary data directly from OpenNPC *eadc* database, more specifically from *etransaction* and *etransactiondata* tables, and present them in OpenNCP dashboard using audit-ui component.

The current version of the OpenNCP is v4.0.3.

To access this specific component, we have to login as an administrator. Once we login, we can access the Audits-ui component as can be seen in Figure 1.

Audits-ui component consists of 3 tabs:

- Atna audits
- Eadc audits
- Statistics

Atna audits tab depicts ATNA (Audit Trail and Node Authentication) information about service consumer, service provider, IHE Transaction, eHDSI Transaction, Event Date and Event outcome. We have the option to download a record (message) or the list with all the messages in Excel Format.

Eadc audits tab lists the services' transactions logs about services, e.g. patient identification query, document list response, document exchanged response with other member states. As can be seen in Figure 2, each line of the list represents a service component Service type. Each record includes the country of origin (sender), the Receiver, the direction (Inbound/Outbound), the start time, the end time and the duration in milliseconds. We have the option to download the list with all the messages in Excel Format.

Statistics tab consist two search engines as can be seen in Figure 3. The first one is called *Total Transactions*. By defining the start datetime (From) and the end datetime (To) we can get a list of the summary of the following types:

1. DOCUMENT_LIST_RESPONSE

² https://ec.europa.eu/cefdigital/wiki/pages/viewpage.action?pagelId=35210477#_ftn1

³

https://ec.europa.eu/cefdigital/wiki/pages/viewpage.action?pagelId=35210477&preview=/35210477/65968072/eHDSI_Monitoring-FWK-KPI_v1.4.1_20180530.pdf#_ftn1

2. DOCUMENT_LIST_QUERY
3. PATIENT_IDENTIFICATION_RESPONSE
4. DOCUMENT_EXCHANGED_RESPONSE
5. DOCUMENT_EXCHANGED_QUERY
6. PATIENT_IDENTIFICATION_QUERY

The second research engine is called *Number of Documents*. By defining the start datetime (From) and the end datetime (To), the document type (in terms of ePrescription, eDispensation and Patient Summary), the direction (in terms of All, Inbound and Outbound) and the country we can get a list of the summary of the Inbound and Outbound documents.

Service consumer Filter by Service consumer	Service Provider Filter by Service Provider	IHE Transaction Filter by IHE Transaction	eHDSI Transaction Filter by eHDSI Transaction	Event date	Event outcome All	Message
	ncc-ppt.cy.ehealth.testa.eu	nccTransformationMgr: Translate	nccTransformationMgr: Translate	25-06-2020 14:52:54	Success	Download
	ncc-ppt.cy.ehealth.testa.eu	nccTransformationMgr: Translate	nccTransformationMgr: Translate	25-06-2020 14:52:54	Success	Download
ncc-ppt.fr.ehealth.testa.eu	ncc-ppt.cy.ehealth.testa.eu	XCA: CrossGatewayRetrieve	PatientService: Retrieve	25-06-2020 14:52:54	Warning	Download
ncc-ppt.fr.ehealth.testa.eu	ncc-ppt.cy.ehealth.testa.eu	XCA: CrossGatewayRetrieve	PatientService: Retrieve	25-06-2020 14:52:54	Success	Download
	ncc-ppt.cy.ehealth.testa.eu	nccTransformationMgr: Translate	nccTransformationMgr: Translate	25-06-2020 14:52:53	Success	Download
ncc-ppt.fr.ehealth.testa.eu	ncc-ppt.cy.ehealth.testa.eu	XCA: CrossGatewayRetrieve	PatientService: Retrieve	25-06-2020 14:52:53	Warning	Download
	ncc-ppt.cy.ehealth.testa.eu	nccTransformationMgr: Translate	nccTransformationMgr: Translate	25-06-2020 14:52:51	Success	Download
ncc-ppt.fr.ehealth.testa.eu	ncc-ppt.cy.ehealth.testa.eu	XCA: CrossGatewayRetrieve	PatientService: Retrieve	25-06-2020 14:52:51	Warning	Download
ncc-ppt.fr.ehealth.testa.eu	ncc-ppt.cy.ehealth.testa.eu	XCA: CrossGatewayRetrieve	PatientService: Retrieve	25-06-2020 14:52:34	Warning	Download
	ncc-ppt.cy.ehealth.testa.eu	nccTransformationMgr: Translate	nccTransformationMgr: Translate	25-06-2020 14:52:33	Success	Download

Figure 1 Audits component on OpenNCP dashboard: Atna audits

Sender Filter by Sender	Receiver Filter by Receiver	Service type Filter by Service type	Direction Filter by Direction	Start time	End time	Duration
CY	IE	PATIENT_IDENTIFICATION_QUERY	OUTBOUND	22-07-2020 23:41:04	22-07-2020 23:41:15	11021
CY	IE	PATIENT_IDENTIFICATION_QUERY	OUTBOUND	22-07-2020 23:29:49	22-07-2020 23:29:58	6818
CY	IE	PATIENT_IDENTIFICATION_QUERY	OUTBOUND	22-07-2020 15:22:54	22-07-2020 15:23:02	7539
fr	CY	DOCUMENT_EXCHANGED_RESPONSE	INBOUND	25-06-2020 14:52:41	25-06-2020 14:52:55	13373
fr	CY	DOCUMENT_EXCHANGED_RESPONSE	INBOUND	25-06-2020 14:52:40	25-06-2020 14:52:54	14163
fr	CY	DOCUMENT_EXCHANGED_RESPONSE	INBOUND	25-06-2020 14:52:39	25-06-2020 14:52:53	14295
fr	CY	DOCUMENT_EXCHANGED_RESPONSE	INBOUND	25-06-2020 14:52:37	25-06-2020 14:52:51	14036
fr	CY	DOCUMENT_EXCHANGED_RESPONSE	INBOUND	25-06-2020 14:52:19	25-06-2020 14:52:34	14493

Figure 2 Audits component on OpenNCP dashboard: Eadc audits

The screenshot shows a web interface for auditing transactions. At the top, there are three tabs: 'Atna audits', 'Eadc audits', and 'Statistics', with 'Statistics' being the active tab. Below the tabs, there are two main sections for filtering data:

- Total transactions:** This section has two date pickers labeled 'From' and 'To', and two buttons labeled 'Search' and 'Reset'.
- Number of documents:** This section has a 'From' date picker, a 'To' date picker, a 'Document type' dropdown menu (currently set to 'ePrescription'), a 'Direction' dropdown menu (set to 'All'), and a 'Country' dropdown menu (set to 'Choose country'). It also has 'Search' and 'Reset' buttons.

Figure 3 Audits component on OpenNCP dashboard: Statistics

The metrics of the KPI-1 Uptake are shown in Table 1. NCPeH CY is responsible to measure KPI-1.1, KPI-1.2, KPI-1.3, KPI-1.4, KPI-1.5, KPI-1.6, KPI-1.7, KPI-1.8, KPI-1.9, KPI-1.11 and KPI-1.10.

Table 1 KPI-1: Uptake Metrics

KPI-1: Uptake metrics
KPI-1.1 Number of Countries with Operational NCPeH
KPI-1.2 Number of transactions between Countries
KPI-1.3 Number of ePrescriptions exchanged
KPI-1.4 Number of eDispensations exchanged
KPI-1.5 Number of Patient Summaries exchanges
KPI-1.6 Number of Dispensation Discard operations performed
KPI-1.7 Services Supported by CY
KPI-1.8 Total Percentages
KPI-1.9 Number of Citizens who can be benefited or not
KPI-1.10 Number of distinct citizens across Europe and nationally who have used the ePrescription service
KPI-1.11 Number of distinct citizens across Europe and nationally who have used the Patient Summary service

2.1.1 KPI-1.1 Number of Countries with Operational NCPeH

As soon as Cyprus will be in Operational Mode regarding NCPeH, we will inform directly eHDSI.

2.1.2 KPI-1.2 Number of transactions between Countries

The scope of KPI-1.2 is to measure the overall number of NCPeH to NCPeH electronic interactions took place in order to understand the overall volume of electronic interactions registered by the NCPeH technical gateway.

KPI-1.2 is being used together with KPI 1.3 and KPI-1.5 to measure the success rate of each Patient encounter, namely, the percentage of processes that manage to complete the 3-interaction scheme to obtain the patient document.

KPI-1.2 includes the following transaction types:

- DOCUMENT_LIST_RESPONSE
- DOCUMENT_LIST_QUERY
- PATIENT_IDENTIFICATION_RESPONSE
- DOCUMENT_EXCHANGED_RESPONSE
- DOCUMENT_EXCHANGED_QUERY
- PATIENT_IDENTIFICATION_QUERY

To measure these transactions, we use Statistics tab of the audit-ui component on OpenNCP dashboard. We use *Total Transactions* search engine for a given period/quarter. An example is depicted in Figure 4, where to find the total number of transactions we sum all the given numbers.

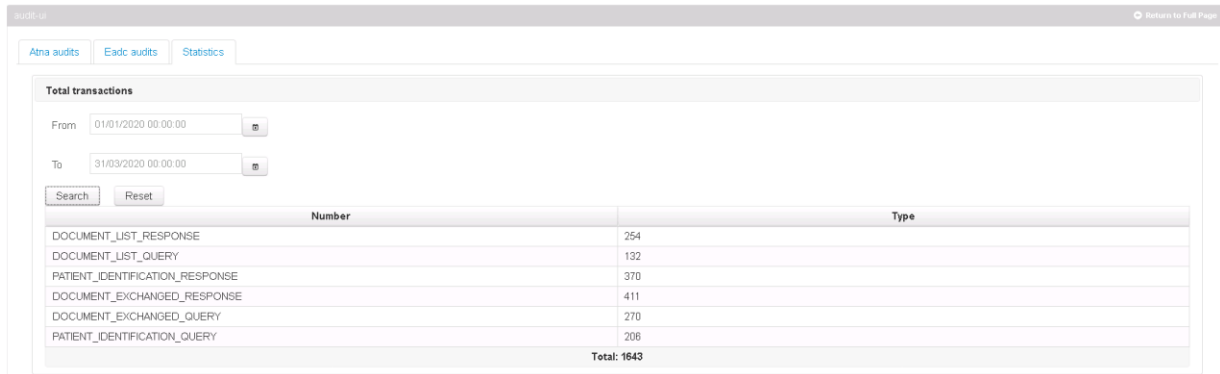


Figure 4 KPI-1.2 measurement

2.1.3 KPI-1.3 Number of ePrescriptions exchanged

The scope of KPI-1.3 is to measure the number of ePrescription documents requested by a Country B to a Country A in order to understand the volume of ePrescription documents exchanged and the rate of ePrescription transactions that resulted in the exchange of ePrescription documents.

For KPI-1.3 we monitor all the ePrescription documents exchanged, PIVOT format and PDF format, either sent from CY as country A and retrieved by other MS as country B, either sent from any other MS as country A and retrieved from CY as country B.

To measure values for KPI-1.3, we use Statistics tab of the audit-ui component on OpenNCP dashboard. We use *Number of Documents* search engine for a given period/quarter, having ePrescription as Document type, Direction value equals to All without selecting any country. This query will return the total number of Inbound and Outbound ePrescription documents exchanged as depicted in Figure 5.



Figure 5 KPI-1.3 Number of ePrescriptions exchanged

2.1.4 KPI-1.4 Number of eDispensations exchanged

The scope of KPI-1.4 is to measure the number of eDispensation documents dispensed by a Country B and/or received by a Country A in order to understand the volume of eDispensation documents exchanged and the rate of eDispensation transactions that resulted in the exchange of eDispensation documents.

For KPI-1.4 we monitor all the eDispensation documents exchanged in PIVOT format, either referred to an ePrescription dispensed from CY as country B and sent to other MS as country A, either referred to an ePrescription dispensed from any other MS as country B and sent to CY as country A.

To measure the KPI-1.4, we use Statistics tab of the audit-ui component on OpenNCP dashboard. We use *Number of Documents* search engine for a given period/quarter, having eDispensation as Document type, Direction value equals to All without selecting any country. This query will return the total number of Inbound and Outbound eDispensation documents exchanged. Cyprus can act either as Country A by receiving an eDispensation document of a Cypriot citizen dispensed by other MS either as Country B by generating an eDispensation document for a certain ePrescription document of a European citizen from any other MS.

2.1.5 KPI-1.5 Number of Patient Summaries exchanges

The scope of KPI-1.5 is to measure the number of Patient Summary documents exchanged in order to understand the volume of Patient Summary documents exchanged and the rate of Patient Summary transactions that resulted in the exchange of Patient Summary documents.

For KPI-1.5 we monitor all the Patient Summary documents exchanged, PIVOT format and PDF format, either sent from CY as country A and retrieved by other MS as country B, either sent from any other MS as country A and retrieved from CY as country B.

To measure the KPI-1.5, we use Statistics tab of the audit-ui component on OpenNCP dashboard. We use *Number of Documents* search engine for a given period/quarter, having Patient Summary as Document type, Direction value equals to All without selecting any country. This query will return the total number of Inbound and Outbound Patient Summary documents exchanged. Cyprus can act either as Country A by generating a Patient Summary document for a Cypriot Citizen either as Country B by retrieving a Patient Summary document of a European citizen from any other MS.

2.1.6 KPI-1.6 Number of Dispensation Discard operations performed

To be supported by 2021.

2.1.7 KPI-1.7 Services Supported by CY

The number of the Operational services for NCPeH CY is 4.

2.1.7.1 KPI-1.7 Countries with eP A Services

NCPeH CY support eP A Service.

2.1.7.2 KPI-1.7 Countries with eP B Services

NCPeH CY support eP B Service.

2.1.7.3 KPI-1.7 Countries with PS A Services

NCPeH CY support PS A Service.

2.1.7.4 KPI-1.7 Countries with PS B Services

NCPeH CY support PS B Service.

2.1.8 KPI-1.8 Total Percentages

2.1.8.1 KPI-1.8.1 Total Number and percentage of Pharmacies enabled with eHDSI services (as Country B)

To be supported by 2021.

2.1.8.2 KPI-1.8.2 Total Number and percentage of Hospitals enabled with eHDSI services (as Country B)

To be supported by 2021.

2.1.8.3 KPI-1.8.3 Total Number and percentage of Other Points of Care enabled with eHDSI services (as Country B)

To be supported by 2021.

2.1.9 KPI-1.9 Number of Citizens who can be benefited or not

2.1.9.1 KPI-1.9.1 Number of citizens who are potentially able to benefit from eHDSI services

To be supported by 2021.

2.1.9.2 KPI-1.9.2 Number of citizens excluding themselves from eHDSI services

To be supported by 2021.

2.1.10 KPI-1.10 Number of distinct citizens across Europe and nationally who have used the ePrescription service

To be supported by 2021.

2.1.11 KPI-1.11 Number of distinct citizens across Europe and nationally who have used the Patient Summary service

To be supported by 2021.

2.2 KPI-2: Quality

2.2.1 KPI-2.1 Citizens awareness about eHDSI services

To be supported by 2021.

2.2.2 KPI-2.2 Citizens perception of eHDSI services value in their lives

To be supported by 2021.

2.2.3 KPI-2.3 Health Professionals awareness eHDSI services

To be supported by 2021.

2.2.4 KPI-2.4 Health Professionals satisfaction from use of eHDSI

To be supported by 2021.

2.3 KPI-3: Uptime

2.3.1 KPI-3.4: NCPeH uptime per country

The scope of KPI-3.4 is to measure the NCPeH uptime in Cyprus in order to understand the uptime for each NCPeH technical gateway and also understand which the root causes of unavailability are and analyze possible mitigation measures.

In order to measure the OpenNCP server uptime, we are using the Zabbix open-source monitoring software. For internal usage, we also capture and monitor the uptime of the National Gateway, which hosts the services PS-A, eP-A and the eDispensation service in the Application server which is responsible to generate the eDispensation document for a European eP that dispensed in Cyprus.

More information about Zabbix Configuration can be found in Section 6 in Annex OP 3 Zabbix Open-source monitoring tool, and more specifically in sub-sections 6.1.1 to 6.1.5.

For data collection regarding KPI-3.4, we login to the Zabbix dashboard as referenced in Section 6.1.5 in Annex OP 3 Zabbix Open-source monitoring tool.

3 KPIs Reporting

For a time-interval corresponding to a Quarter of the year, we will collect all the KPIs data as referenced in Section 2 and we will provide them to the eHDSI support services (SANTE-EHEALTH-DSI-SUPPORT@ec.europa.eu).

The defined time-intervals for data collection are:

- Q1: Jan to Mar
- Q2: Apr to Jun
- Q3: Jul to Sep
- Q4: Oct to Dec

We will provide official quarterly updates to eHDSI when Cyprus will go live to production system. The reporting periods are defined by eHDSI and are shown on the figure below.

