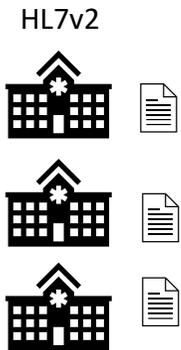
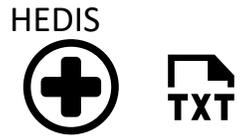


IIS Bulk Data Demands and FHIR: Discussion on Direction and Solutions

Kevin Snow, CTO
Gary Wheeler, SVP
AIRA National Meeting
May 2023

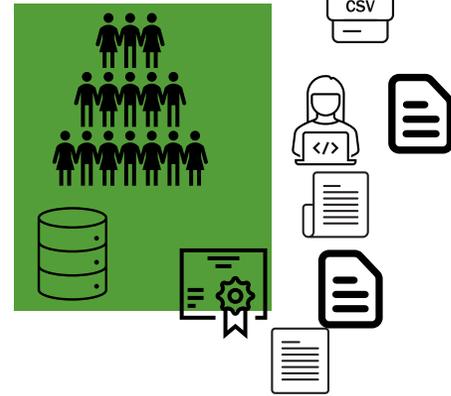


Our current landscape



PULL

IIS



DIRECT

CVRS(Tab)



MVRS



IZ Gateway



Routine
Flu

PUSH



HL7v2 vs HL7 FHIR



1989
HL7 v2



2000/2001
JSON/Rest



2014
HL7 FHIR



2021
SMART
Health
Cards

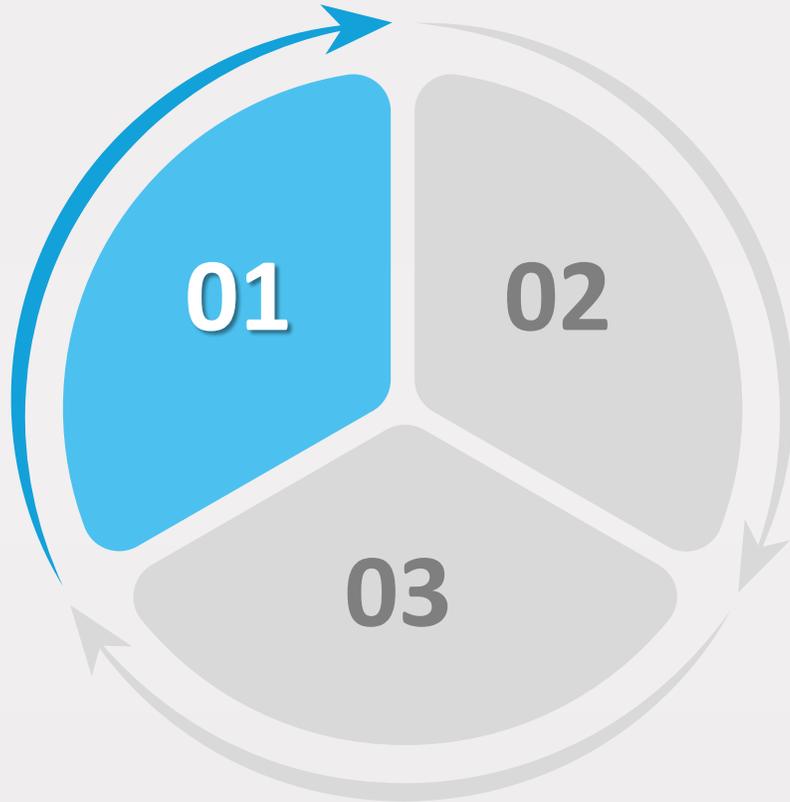


HL7v2

```
...  
PID|1||2002^^^KS9999^MR||Simpson^Bart^B^^^^L||19990101  
...  
RXA|0|1|20210101||207^COVID-19 mRNA (MOD)^CVX|999|||01  
^historical^NIP001||^^^KS9999|||||||CP|A
```

```
1 {  
2   "resourceType": "Bundle",  
3   "type": "collection",  
4   "entry": [  
5     {  
6       "fullUrl": "resource:0",  
7       "resource": {  
8         "resourceType": "Patient",  
9         "name": [  
10        {  
11          "family": "Simpson",  
12          "given": [  
13            "Bart",  
14            "B."  
15          ]  
16        }  
17      ],  
18      "birthDate": "1999-01-01"  
19    }  
20  },  
21  {  
22    "fullUrl": "resource:1",  
23    "resource": {  
24      "resourceType": "Immunization",  
25      "status": "completed",  
26      "vaccineCode": {  
27        "coding": [  
28          {  
29            "system": "http://hl7.org/fhir/sic  
30            "code": "207"  
31          }  
32        ]  
33      },  
34      "patient": {  
35        "reference": "resource:0"  
36      },  
37      "occurrenceDateTime": "2021-01-01",
```

How does FHIR work with Bulk Query?



Request

After authenticating you can request bulk data by entering the appropriate URL into your browser.



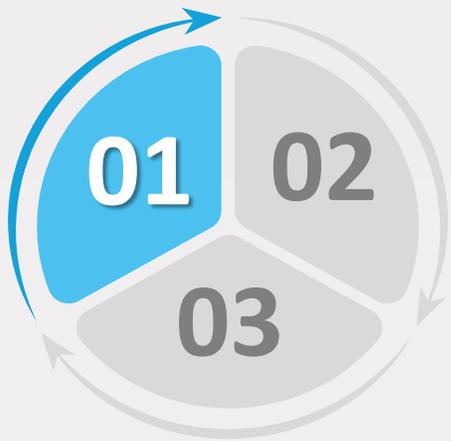
Retrieve

In the step above, a URL will be returned where you can check the status of your export. Once complete, that URL will list the links to the file to download.



Report

Open the files from the export directly into your reporting and analytics tools.



Request

After authentication, you can request bulk data by entering the appropriate URL into your browser.

Authenticate. Enter the Group name in a browser. Hit Enter.



Browser Response Header(s)

content-length: 280

content-location: **https://bulkdataexample.com/_operations/export/AllActivePatientsTwoOrUnder_Export_1234**

content-type: application/fhir+json



Retrieve

In the step above, a URL will be returned where you can check the status of your export. Once complete, that URL will list the links to the file to download.

 https://bulkdataexample.com/_operations/export/AllActivePatientsTwoOrUnder_Export_1234

```
1 {
2   "transactionTime": "2023-04-20T22:40:39.2022689+00:00",
3   "request": "https://bulkdataexample.com/r4/Group/AllActivePatientsTwoOrUnder/$export",
4   "requiresAccessToken": false,
5   "output": [
6     {
7       "type": "Patient",
8       "url": "https://bulkdataexample.com/AllActivePatientsTwoOrUnder_Export_1234/Patient_0.ndjson",
9       "count": 100000
10    },
11    {
12      "type": "Patient",
13      "url": "https://bulkdataexample.com/AllActivePatientsTwoOrUnder_Export_1234/Patient_1.ndjson",
14      "count": 84785
15    },
16    {
17      "type": "Immunization",
18      "url": "https://bulkdataexample.com/AllActivePatientsTwoOrUnder_Export_1234/Immunization_0.ndjson",
19      "count": 1000000
20    },
21    {
22      "type": "Immunization",
23      "url": "https://bulkdataexample.com/AllActivePatientsTwoOrUnder_Export_1234/Immunization_1.ndjson",
24      "count": 1000000
25    }
26  ]
27 }
```

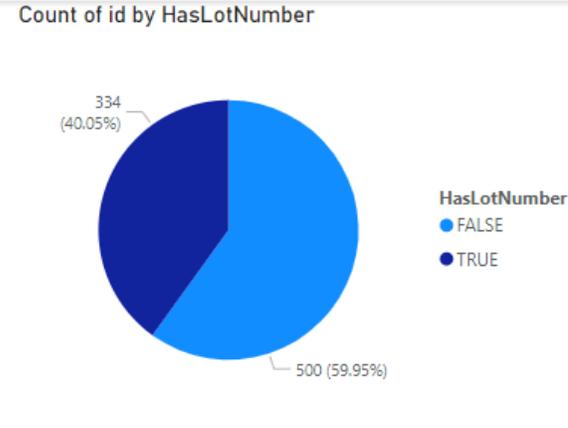
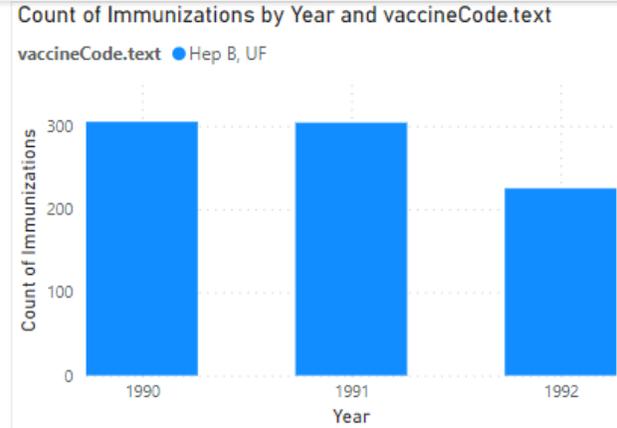


Report

Open the files from the export directly into your reporting and analytics tools.

Power BI Desktop interface showing the Power Query Editor. The query is named 'Immunization_0 (1)' and its formula bar contains: `= Table.ReorderColumns("#Changed Type",{ "resourceType", "id", "vaccineCode.text", "occurrenceDate" })`

id	resourceType	id	vaccineCode.text	occurrenceDate
1	Immunization	00336772-e66c-48dd-931a-cf5e2f07ad34	Hep B, UF	
2	Immunization	00844c07-5df3-461d-a791-4cbfeec29299	Hep B, UF	
3	Immunization	0123d15a-c84b-4d6e-b645-e91829c2c869	Hep B, UF	
4	Immunization	0135c16b-4428-4da5-ae97-9902b9c7ba85	Hep B, UF	
5	Immunization	014a3c6d-8e5b-44e1-919c-c99584755f95	Hep B, UF	
6	Immunization	014f030f-6bff-4479-8117-003773c2c738	Hep B, UF	
7	Immunization	01706e2a-ee33-445e-9d4e-798844968513	Hep B, UF	
8	Immunization	021eaa0b-60ba-477e-81ad-2e4572994039	Hep B, UF	
9	Immunization	024b5a43-d7ae-4d3d-b5ed-48c3ded28c7a	Hep B, UF	
10	Immunization	0296c070-17ec-4b78-9653-74e5556485c5	Hep B, UF	
11	Immunization	02f34030-1da0-4657-b428-c04b20d57037	Hep B, UF	
12	Immunization	030f4e48-475e-46ad-b5ca-a9df06229605	Hep B, UF	5/23/1990
13	Immunization	031deb1d-8d38-4d4b-90e6-b7d673c76d...	Hep B, UF	8/8/1990
14	Immunization	0376a6c8-e1a5-411a-b545-b37f09697ad	Hep B, UF	1/11/1990
15	Immunization	04130f4e-b18b-4051-a7a3-0f838c45068	Hep B, UF	3/15/1992



id	vaccineCode.text	Year	Month	Day	patient.reference
00336772-e66c-48dd-931a-cf5e2f07ad34	Hep B, UF	1991	November	14	Patient/bf4d5459-63d6-4254-821e-213192f6c62f
00844c07-5df3-461d-a791-4cbfeec29299	Hep B, UF	1990	June	18	Patient/fdc1cbef-3e9f-468a-ba32-b9c26be028a1
0123d15a-c84b-4d6e-b645-e91829c2c869	Hep B, UF	1990	May	25	Patient/c4a5d509-3a6d-4161-bfaf-d4963f8ee4a7
0135c16b-4428-4da5-ae97-9902b9c7ba85	Hep B, UF	1992	August	30	Patient/d7d04cff-aa97-4fbb-a0b5-e818cdb7ff51
014a3c6d-8e5b-44e1-919c-c99584755f95	Hep B, UF	1990	April	21	Patient/0daab9ba-64ed-41dc-a11b-2611057e4fe9
014f030f-6bff-4479-8117-003773c2c738	Hep B, UF	1991	August	9	Patient/d6e60bc9-8911-4540-8edb-2827b7d782d1
01706e2a-ee33-445e-9d4e-798844968513	Hep B, UF	1992	January	15	Patient/bb331b68-53b4-49c5-a51a-bd77308630d4
021eaa0b-60ba-477e-81ad-2e4572994039	Hep B, UF	1991	February	7	Patient/788ffe4-0940-40b6-b084-f42b51f24aab
024b5a43-d7ae-4d3d-b5ed-48c3ded28c7a	Hep B, UF	1990	July	3	Patient/bef6fafb-cb05-4a75-a905-fb254d9d707b
0296c070-17ec-4b78-9653-74e5556485c5	Hep B, UF	1990	February	12	Patient/8bae6eec-9cd8-4a58-8b36-1da3a3b97d21
02f34030-1da0-4657-b428-c04b20d57037	Hep B, UF	1991	February	9	Patient/7217c598-188f-4593-a8e8-41b78a82e6a6
030f4e48-475e-46ad-b5ca-a9df06229605	Hep B, UF	1990	May	23	Patient/1effa9fa-28ba-4824-ab9f-17d28dc77e1
031deb1d-8d38-4d4b-90e6-b7d673c76d8	Hep B, UF	1990	August	8	Patient/564fb2d9-e1c2-457e-ba39-20b5c3c63a46
0376a6c8-e1a5-411a-b545-b37f09697ad	Hep B, UF	1990	January	11	Patient/91655616-18b2-45d8-8b57-803fc2a13acd



 **Report**

Open

< > > This PC > OS (C:) > temp > FHIRPowerBIDemo

Search FHIRPowerBIDemo

Organize New folder

Name	Date modified	Type	Size
PowerBI-FHIRTemplate.pbix	4/20/2023 5:40 PM	Microsoft Power B...	15 KB

File name:

Power BI template files (*.pbix)

Open Cancel

<https://www.menti.com/> - 2593 2993



What are the perceived barriers to working with FHIR Bulk Data export?

23 Answers



Provider adoption

Knowledgeable staff

Cost and development time to implement it large sale

Knowledge base, implementation

Funding

"If you build it, they will come." — but what if you build it but they *don't* come?

Loss of process (e.g., can't review data before it goes out the door)

Buy-in from leadership

Day to day technology is not able to use FHIR resources.

What are the perceived barriers to working with FHIR Bulk Data export?

23 Answers

Money, technical training for IIS epis and data analysts, finding the right people to discuss use cases

Industry adoption

Training and development

Getting upper management to understand what FHIR is and why we should be using it

Development cost vs. benefit

Lack of familiarity with FHIR in general.

How to develop

"If it ain't broke, don't fix it" — QBP works and it's hard to convince stakeholders to fix things that they don't perceive are broken.

Still would like to see how it works in a real world example.

What are the perceived barriers to working with FHIR Bulk Data export?

23 Answers



How to develop.

Knowing how to limit requestors from requesting information they shouldn't have access to

Not having enough knowledge about FHIR.

Difficulty finding clinical partners willing to try it

What volume can be supported with bulk FHIR query?

Appendix

- Advanced Bulk Data Requests
- Full Specification
- Bonus *What If* – FHIR + IZ Gateway



1. Request (Advanced)

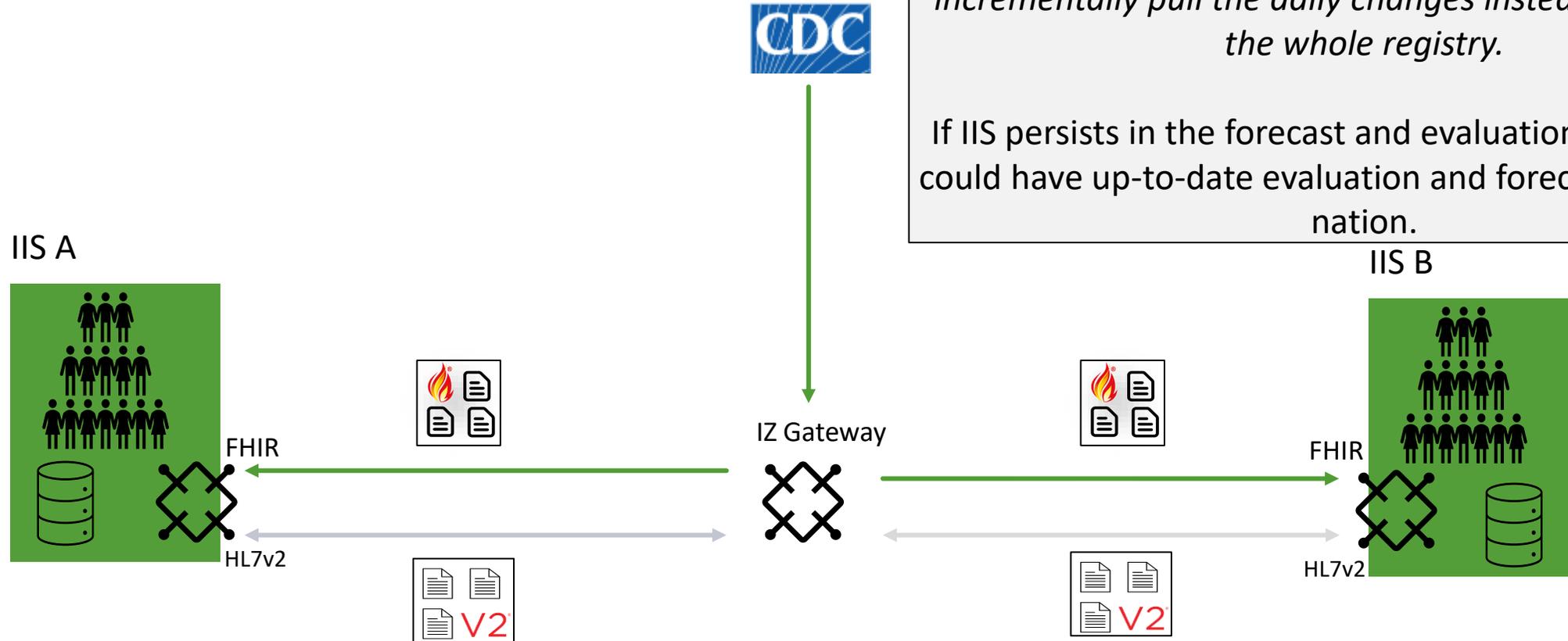
Advanced Options: Only select certain **_type(s)**(i.e., tables), only changes **_since** a date, etc.

 [https://bulkdataexample.com/fhir/r4/group/AllActivePatientsTwoOrUnder/\\$export?_type=Patient%2CImmunizationRecommendation](https://bulkdataexample.com/fhir/r4/group/AllActivePatientsTwoOrUnder/$export?_type=Patient%2CImmunizationRecommendation)

Full Specification

<https://build.fhir.org/ig/HL7/bulk-data/export.html>

Bonus – What If – You could get data in bulk from any IIS from one location



CDC could pull 100% of the US population at any time. *In addition, if IIS supported the `_since` parameter, you could incrementally pull the daily changes instead of extracting the whole registry.*

If IIS persists in the forecast and evaluation resources, we could have up-to-date evaluation and forecast views of the nation.