

Kansas IIS (KSWebIZ) Data Quality Pilot Project



Project Goals

- Improve overall KSWebIZ data quality.
- Identify problematic data quality issues for individual clinics.
- Educate clinics on use of KSWebIZ data quality reports.
- Correct erroneous or identify missing data.
- Advise clinical process flow to improve data quality (i.e. data entry, etc.)

Specific Patient DQ Target Areas

- Patient Data Completeness
 - Patient Date of Birth
 - Patient Name (last, first)
 - Gender
 - Race/Ethnicity
 - Mother's Name (first, last, maiden)
 - Patient Address
 - VFC Eligibility (patient level)

Specific Vaccination DQ Target Areas

- Vaccination Completeness
 - Missing/incorrect data for non-historical vaccinations
 - MFG
 - Lot Number
 - Expiration Date
 - Funding Source
 - Body Site/Route
 - Unspecified Formulation (UF)

Specific Vaccination DQ Target Areas (cont'd)

- Vaccination Accuracy
 - Vaccinations given at Invalid Age
 - Looked at specific vaccines that were administered outside the ACIP recommendation (age).
 - Vaccinations Count Inconsistent with Age
 - Looked at total counts of vaccinations given at specific ages (i.e. too many for that specific age).
- Vaccination Timeliness
 - Vaccinations given >7 days of administration date.

Timeline

- May 2013
 - Deployed New IZ Data Quality report to production
- June 2013
 - Sent out Call for pilot users (survey)
- July 2013
 - Ran baseline reports for clinics
 - Educated clinics on reports and how to 'clean' data
- August – Sept 2013
 - Ran monthly status reports to review progress
 - Surveyed participants (end of Sept) for feedback

Data Quality Tool Design

- Idea for Data Quality Tool
 - September 2008: As a result of working on the MIROW DQ Chapter
 - Reviewed chapter and pulled out specific measurements that would be useful to check Data Quality in the system
- Design
 - September - December 2008
 - Input from VFC and KSWebIZ staff to expand and refine parameters

Data Quality Tool Development

- December 2008
 - Measurements transcribed into data queries generated by KSWebIZ Vendor
- December 2008-January 2009
 - Tool generated in PDF format (statistics portion only)
- January 2009-present
 - Tested tool; added patient level exceptions report
- Late 2012
 - Released to the KSWebIZ Test Site
- May 2013
 - Released to the KSWebIZ Production Site

IZ Data Quality Tools

- Three types of reports are available:
 - Data Quality, Statistics – Scheduled
 - A scheduled report that presents a static view of clinic data based on the date it is generated. Snapshot of entire history for a clinic.
 - Full assessment of all data.
 - Ran monthly so clinic could review progress in changes of data.

Data Quality, Statistics – Scheduled

Search Criteria

Provider
KDHE IMMUNIZATION PROGRAM

Clinic
KDHE IMMUNIZATION PROGRAM-C1

Statistics Generated Date Range
From: Through:

Search Results - 1 record(s)

Output Type: PDF EXTRACT - Delimiter:

	Provider	Clinic	Date Generated
<input type="radio"/>	KDHE IMMUNIZATION PROGRAM	KDHE IMMUNIZATION PROGRAM-C1	Apr 11 2013 7:01 pm

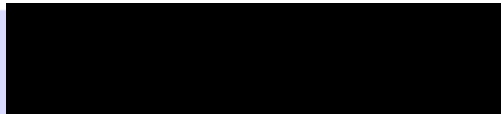
Data Quality, Statistics – Scheduled



Kansas Immunization Registry Data Quality, Statistics - Scheduled (Beta Test)

September 12, 2013

Provider:
Clinic:



Go Live Date: 01/20/2012
Legacy Data Import Date:
Legacy Data System:

Date Generated: Apr 12 2013 10:01 am

Inventory Type: 3 HL7 Facility Code(s): NONE
Jurisdiction: KANSAS

PATIENT COUNTS

This section calculates the number and percentage of patients associated to the clinic according to their patient program status.

	Patients	Percentage	Percentage of Total Patients
Active Patients in Jurisdiction	83	100.00%	95.40%
Active Patients not in Jurisdiction	0	0.00%	0.00%
Total Active Patients	83	100.00%	95.40%
Inactive Patients - Moved Out of Area	1	25.00%	1.15%
Inactive Patients - Other Immunization Provider	2	50.00%	2.30%
Inactive Patients - Unable To Locate	1	25.00%	1.15%
Total Inactive Patients	4	100.00%	4.60%
Total Patients	87	100.00%	100.00%

PATIENT COMPLETENESS

This section calculates the number and percentage of active patient records that have a value in the following data fields.

	Patients	Percentage of Total Active Patients
Patients with First Name	83	100.00%
Patients with Last Name	83	100.00%
Patients with Middle Name	74	89.18%
Patients with DOB	83	100.00%
Patients with SSN	66	79.52%
Patients with Gender	83	100.00%
Patients with Birth State	64	77.11%
Patients with Birth Country	64	77.11%
Patients with Birth Order	20	24.10%
Patients with Race	71	85.54%
Patients with Ethnicity	72	86.75%
Patients with VFC Eligibility	83	100.00%



Provider: XXXXXXXXXX
 Clinic: XXXXXXXXXX

Date Generated: Apr 12 2013 10:01 am

Patients with Mother's First Name	66	79.52%
Patients with Mother's Middle Name	30	38.14%
Patients with Mother's Maiden Name	66	79.52%
Patients with Mother's Last Name	63	75.90%
Patients with Street Name or PO Box	83	100.00%
Patients with City	83	100.00%
Patients with County	80	98.39%
Patients with State	83	100.00%
Patients with Zip Code	83	100.00%
Patients with Home Phone Number	58	69.88%
Patients with Cell Phone Number	0	0.00%
Patients with Email Address	0	0.00%
Patients with History of Varicella Disease	3	3.61%
Patients with Date of Varicella Disease	3	3.61%
Patients created by Vital Statistics Import	0	0.00%

VACCINATION COMPLETENESS

This section calculates the number and percentage of vaccination events (for those active patients associated to the selected clinic) that have a value in the following data fields for each category.

	All Vaccinations	Percentage of All Vaccinations	All Non-Historical Vaccinations	Percentage of All Non-Historical Vaccinations	Clinic Non-Historical Vaccinations	Percentage of Clinic Non-Historical Vaccinations
Total Vaccinations	1,549	100.00%	483	100.00%	241	100.00%
Vaccinations Added but not Administered	0	0.00%	0	0.00%	0	0.00%
Vaccinations with Vaccination Date	1,549	100.00%	483	100.00%	241	100.00%
Vaccinations with Manufacturer	616	39.77%	427	88.41%	241	100.00%
Vaccinations with Lot Number	507	32.73%	422	87.37%	241	100.00%
Vaccinations with Expiration Date	499	32.21%	422	87.37%	241	100.00%
Vaccinations with NDC	158	10.20%	158	32.71%	136	56.43%
Vaccinations with Funding Source	376	24.27%	374	77.43%	241	100.00%
Vaccinations with Site	361	23.31%	343	71.01%	241	100.00%
Vaccinations with Route	367	23.69%	343	71.01%	241	100.00%
Vaccinations with Administered By	344	22.21%	343	71.01%	241	100.00%
Non-Historical Vaccinations with VIS Date Given	297	61.49%	297	61.49%	214	88.80%
Non-Historical Vaccinations with VIS Effective Date	297	61.49%	297	61.49%	214	88.80%
Unspecified Formulation (UF) entered as Non-Historical Vaccines	4	0.83%	4	0.83%	0	0.00%

Provider: [REDACTED]
 Clinic: [REDACTED]

Date Generated: Apr 12 2013 10:01 am

ACCURACY, VACCINATION GIVEN AT INVALID AGE

This section calculates the number and percentage of vaccination events and the patients impacted (for patients associated to the clinic) that were given any single immunization outside of ACIP age recommendations or vaccine label guidelines for each category.

	All Vaccinations	Percentage of All Vaccinations	Number of Patients Impacted	Clinic Vaccinations	Percentage of Clinic Vaccinations	Number of Patients Impacted
Total Vaccinations	1,549	100.00%	83	246	100.00%	76
DTaP / TD / TDAP Vaccinations before 6 weeks of age	0	0.00%	0	0	0.00%	0
DT / DTP / DTaP Vaccinations after 7 years (2557 days) of age	3	0.19%	3	0	0.00%	0
Td / Tdap Vaccinations before 7 years (2553 days) of age	0	0.00%	0	0	0.00%	0
Kinrix (DTaP-IPV) Vaccinations before 4 years (1457 days) of age	1	0.06%	1	0	0.00%	0
Polio Vaccinations before 6 weeks of age	0	0.00%	0	0	0.00%	0
MMR Vaccinations before 1 year (361 days) of age	3	0.19%	3	0	0.00%	0
Hib Vaccinations before 6 weeks of age	1	0.06%	1	0	0.00%	0
Hib Vaccinations after 6 years (2190 days) of age	0	0.00%	0	0	0.00%	0
Varicella (CPOX) Vaccinations before 1 year (361 days) of age	2	0.13%	2	0	0.00%	0
Pneumococcal Vaccinations before 6 weeks of age	0	0.00%	0	0	0.00%	0
PPV23 Vaccinations before 2 years (726 days) of age	0	0.00%	0	0	0.00%	0
HPV Vaccinations before 9 years (3283 days) of age	0	0.00%	0	0	0.00%	0
HPV Vaccinations after 28 years (10226 days) of age	0	0.00%	0	0	0.00%	0
Cervarix Vaccinations and a gender of Male	0	0.00%	0	0	0.00%	0
Hep A Vaccinations before 1 year (361 days) of age	1	0.06%	1	0	0.00%	0
Meningococcal Vaccinations before 11 years of age	0	0.00%	0	0	0.00%	0
Influenza Vaccinations before 6 months of age	0	0.00%	0	0	0.00%	0
Rotavirus Vaccinations before 6 weeks of age	0	0.00%	0	0	0.00%	0
First dose of Rotavirus after 12 weeks of age	5	0.32%	5	1	0.41%	1
Rotavirus Vaccinations after 32 weeks of age	0	0.00%	0	0	0.00%	0
Non-Hep B Vaccinations before 4 weeks of age	1	0.06%	1	0	0.00%	0
Zoster Vaccinations before 50 years (18258 days) of age	0	0.00%	0	0	0.00%	0
Vaccinations before their DOB	0	0.00%	0	0	0.00%	0
Vaccinations after the Expiration Date	8	0.52%	5	0	0.00%	0
Vaccinations in the future	0	0.00%	0	0	0.00%	0

ACCURACY, VACCINATION COUNTS INCONSISTENT WITH PATIENT'S AGE

This section calculates the number and percentage of active patient records (associated to the clinic) that have a total number of vaccinations that is more than what is appropriate for their age.

	Patients	Percentage of Active Patients
Patients with more than 2 DTaP Vaccinations before 4 months of age	0	0.00%
Patients with more than 3 DTaP Vaccinations before 6 months of age	0	0.00%
Patients with more than 4 DTaP Vaccinations before 1 year of age	0	0.00%
Patients with more than 6 DTaP Vaccinations before 7 years of age	0	0.00%
Patients with more than 2 Polio Vaccinations before 4 months of age	0	0.00%
Patients with more than 2 HIB Vaccinations before 4 months of age	1	1.20%
Patients with more than 3 HIB Vaccinations before 6 months of age	0	0.00%
Patients with more than 4 HIB Vaccinations before 1 year of age	0	0.00%
Patients with more than 2 PCV Vaccinations before 4 months of age	0	0.00%
Patients with more than 3 PCV Vaccinations before 6 months of age	0	0.00%
Patients with more than 4 PCV Vaccinations before 1 year of age	0	0.00%
Patients with more than 2 HepA Vaccinations	2	2.41%
Patients with more than 4 HepB Vaccinations	2	2.41%
Patients with more than 4 HIB Vaccinations	2	2.41%
Patients with more than 3 HPV Vaccinations	0	0.00%
Patients with more than 3 Meningococcal Vaccinations	0	0.00%
Patients with more than 2 MMR Vaccinations	3	3.61%
Patients with more than 4 PCV Vaccinations	2	2.41%
Patients with more than 3 Rotavirus Vaccinations	0	0.00%
Patients with more than 1 Tdap Vaccinations	1	1.20%
Patients with more than 2 Varicella Vaccinations	1	1.20%
Patients with 10 or more Vaccinations on the same date	0	0.00%
Patients with 20 or more Vaccinations before 6 months of age	0	0.00%
Patients with 30 or more Vaccinations before 2 years of age	0	0.00%
Patients with 40 or more Vaccinations before 5 years of age	0	0.00%
Patients with 70 or more Vaccinations	0	0.00%

TIMELINESS

This section calculates the number and percentage of vaccinations events where the amount of time elapsed between the date of vaccination and the date it was created in the IIS is within the indicated timeframes for each category.

	All Vaccinations	Percentage of All Vaccinations	Clinic Vaccinations	Percentage of Clinic Vaccinations
Total Vaccinations	1,549	100.00%	246	100.00%
Vaccinations entered < 1 day of Administration	317	20.46%	165	67.07%
Vaccinations entered in at least 1 day and < 2 days of Administration	49	3.16%	39	15.85%
Vaccinations entered in at least 2 days and < 7 days of Administration	59	3.81%	19	7.72%
Vaccinations entered in at least 7 day and < 14 days of Administration	19	1.23%	9	3.66%
Vaccinations entered in at least 14 day and < 30 days of Administration	31	2.00%	13	5.28%
Vaccinations entered in 30 days or more of Administration	1,074	69.34%	1	0.41%



Provider: [REDACTED]
Clinic: [REDACTED]

Date Generated: Apr 12 2013 10:01 am

INVENTORY MANAGEMENT

This section summarizes several key Inventory elements for full Inventory (type 3) providers. Count

Number of Active Inventory Locations	1
Number of Closed Reconciliations within the last 12 months	9
Total Number of Closed Reconciliations	11
Number of Expired Inventory Line Items with Quantity > 0	2
Total Number of Doses Wasted or Expired in the last 12 months	87



IZ Data Quality Tools (cont'd)

- Data Quality, Statistics
 - Run on an as-needed basis (real-time)
 - Limited to a one-month timeframe (either DOB or vaccination date range)
 - Clinic generates and uses data to track results of data cleansing for selected variables.

Data Quality, Statistics

Report Selection Criteria

Provider
KDHE IMMUNIZATION PROGRAM

Clinic
KDHE IMMUNIZATION PROGRAM-C1

Date of Birth Date Range
From: Through:

Vaccination Date Range
From: Through:

Output Type: PDF EXTRACT - Delimiter:

- Same layout as previous report just different data.

IZ Data Quality Tools (cont'd)

- Data Quality, Patient Exceptions
 - Run on an as-needed basis (real-time)
 - Limited to a one-month timeframe (either DOB or vaccination date range)
 - Clinic generates and uses data to track results of individual patient records with identified data issues.

Data Quality, Patient Exceptions



Report Selection Criteria

Provider
KDHE IMMUNIZATION PROGRAM



Clinic
KDHE IMMUNIZATION PROGRAM-C1

Report Section
ACCURACY, VACCINATION GIVEN AT INVALID AGE

Report Section Line Item
(ALL REPORT SECTION LINE ITEMS)

Date of Birth Date Range
From:  Through: 

Vaccinations Criteria

Vaccination Date Range
From:  Through: 

Vaccinations: All Historical only Non-Historical only

Output Type: PDF EXTRACT - Delimiter:

Data Quality, Patient Exceptions



Kansas Immunization Registry Data Quality, Patient Exceptions (Beta Test)

September 12, 2013

Report Section = PATIENT COMPLETENESS, Report Section Line Item = All, Date of Birth Date - From = 12/07/2011, Date of Birth Date - Through = 12/07/2011, Vaccinations = Non-Historical

Provider: KANSAS WEBIZ TRAINING	Go Live Date	Legacy Data Import Date	Legacy Data System
Clinic: KSWEBIZ DATA QUALITY 1000 SW JACKSON, UNIT #210 TOPEKA, KS 66612			
Data Generated: Sep 12 2013 11:50 am			

Inventory Type: 3 **HL7 Facility Code(s):** NONE

BUSINESS, CHARLENE (2427920) DOB: 12/07/2011

PATIENT COMPLETENESS

Patients with Middle Name	
Patients with SSN	
Patients with Birth State	
Patients with Birth Country	
Patients with Birth Order	
Patients with Race	
Patients with Ethnicity	
Patients with VFC Eligibility	
Patients with Mother's First Name	
Patients with Mother's Middle Name	
Patients with Mother's Maiden Name	
Patients with Mother's Last Name	
Patients with Street Name or PO Box	
Patients with City	
Patients with County	
Patients with State	
Patients with Zip Code	
Patients with Home Phone Number	
Patients with Cell Phone Number	
Patients with Email Address	

Total Exceptions for Patient Id 2427920	20
Total Patients	1



Data Quality, Patient Exceptions



Kansas Immunization Registry Data Quality, Patient Exceptions (Beta Test)

September 09, 2013

Report Section = ACCURACY, VACCINATION GIVEN AT INVALID AGE, Report Section Line Item = All, Date of Birth Date - From = 12/07/2011, Date of Birth Date - Through = 12/07/2011, Vaccinations = Historical

Provider: KANSAS WEBIZ TRAINING
Clinic: KSWEBIZ DATA QUALITY
1000 SW JACKSON, UNIT #210
TOPEKA, KS 66612

Go Live Date Legacy Data Import Date Legacy Data System

Data Generated: Sep 9 2013 3:58 pm

Inventory Type: 3 HL7 Facility Code(s): NONE

BUSINESS, CHARLENE (2427920) DOB: 12/07/2011

ACCURACY, VACCINATION GIVEN AT INVALID AGE

DTaP / TD / TDAP Vaccinations before 6 weeks of age

Polio Vaccinations before 6 weeks of age

Pneumococcal Vaccinations before 6 weeks of age

Clinic Code	Historical?	Vaccine	Vaccination Date
PR	Y	DTaP-HepB-IPV (Pedla)	01/07/2012
PR	Y	DTaP-HepB-IPV (Pedla)	01/07/2012
PR	Y	PCV-13 (Prevnar)	01/07/2012
Total Exceptions for Patient Id 2427920			3
Total Patients			1

Selection of Providers

- Reviewed all provider profiles of respondents of survey.
- Selected 15 providers based on the following criteria:
 - HL7 Interface providers vs. Direct Entry providers
 - NOTE: All interfacing providers currently use the HL7 2.3.1 standard and exchange data bi-directionally with KSWebIZ
 - Small, Medium vs. Large clinics
 - Small: 100-999 patients
 - Medium: 1,000-9,999 patients
 - Large: 10,000+ patients
 - Private provider clinics vs. Public provider clinics

Selection of Providers

Public vs. Private	Direct Access vs. Interfaced	Small vs. Medium vs. Large
Public: 8	Direct Access: 8	Small: 2
Private: 7	Interfaced: 7	Medium: 8
		Large: 5

Provider Profiles

Clinic Name	Public vs. Private	# Patients (Approx.)	Type of Access
Konza Prairie	Private	2,341	Direct
Norton CHD	Public	5,437	Direct
St. Francis Fam Med Jewell	Private	1,570	Direct
Logan CHD	Public	3,948	HL7 2.3.1 PHClinic, KIPHS
Mercy Clinic	Private	4,296	HL7 2.3.1 EPIC
Mercy and Truth	Private	231	Direct
St. Francis Fam Med Hunter's Ridge	Private	126	Direct
Douglas CHD	Public	40,637	HL7 2.3.1 Netsmart, Insight

Provider Profiles (cont'd)

Clinic Name	Public vs. Private	# Patients	Type of Access
Meade CHD	Public	7,880	HL7 2.3.1 PHClinic, KIPHS
Wyandotte CHD	Public	33,122	HL7 2.3.1 NetSmart, Insight
Med Ped Clinic West	Private	1,542	Direct
Riley CHD	Public	33,902	Direct
St. Francis Fam Med Mission Woods	Private	8,446	Direct
McPherson CHD	Public	16,743	HL7 2.3.1 PHClinic, KIPHS
Sedgwick CHD	Public	61,348	HL7 2.3.1 PHClinic, KIPHS

Results of Data Quality Pilot

- Identified Issues with Beta DQ Reports
 - Identified bug in calculation of one of the line items (Rotavirus).
 - Total Percentage of Patients was of complete population but want to add additional line to only look at Total Percentage of Patients under 19 years of age.
 - Some line items are based off ACIP recommendation which are subject to change, so report will need to be reviewed often for changes (minimum = annually).

Results of Data Quality Pilot (cont'd)

- Identified Issues with data coming from HL7 Interfacing Clinics
 - Some clinics not sending lot number, expiration date, body site/route, MFG for administered vaccinations.
 - After working with vendor, these issues were addressed.
 - Administered vaccinations were not timely (> 7 days of administration)
 - After education this improved.
 - Clinics entered Patient VFC Eligibility and VIS Information into EMR system but was not transferred to KSWebIZ
 - Currently working with vendors to resolve this.

Results of Data Quality Pilot (cont'd)

- Identified Issues with data coming from HL7 Interfacing Clinics (cont'd)
 - Added prompt in EMR system to add Mother's Maiden name and additional demographics.
- Overall data quality improvements
 - Increased percentage of demographics data
 - Race/Ethnicity
 - Mother's first, last, and maiden name
 - Increased number of records with complete address data.

Results of Data Quality Pilot (cont'd)

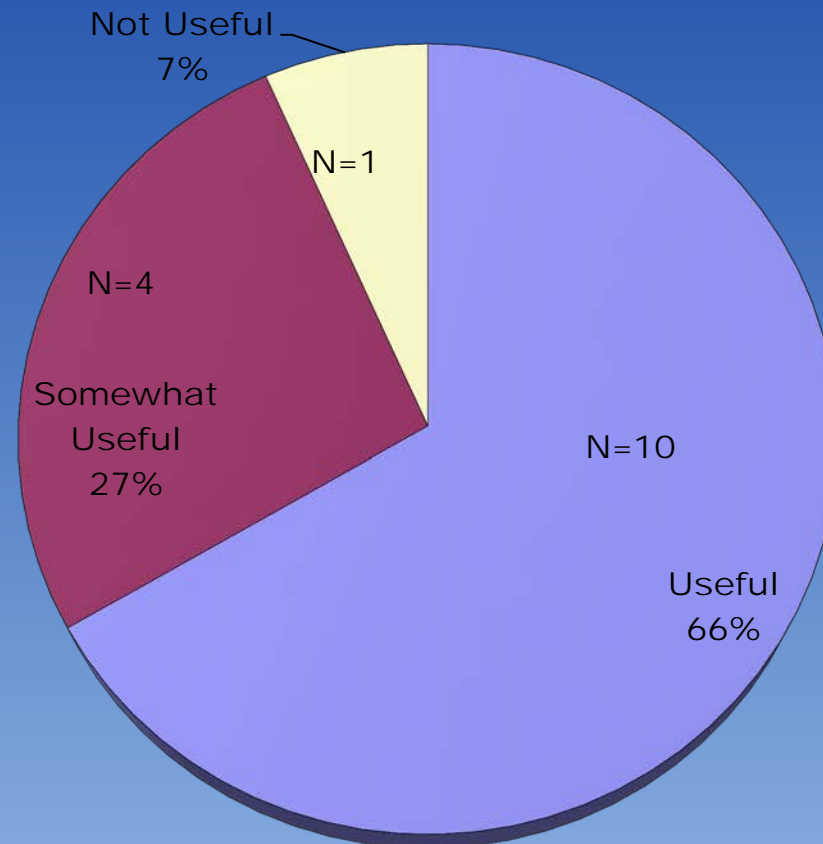
- Improvements on clinic administration process
 - Number of invalid doses decreased administered going forward
 - Decreased number of MMR, Hep A, and Varicella vaccinations given before 1 year.
 - Decreased number of DTaP vaccinations given before 6 weeks of age.
 - Decreased Meningococcal vaccinations before 11 years of age.
- Data Quality Coordinator getting more feedback from clinics with DQ issues.
- For Direct Access Clinics increases in VIS Date Given and VIS Effective Date for administered vaccinations.

Results of Data Quality Pilot (cont'd)

- Unresolved Issues to be addressed...
 - Documentation of inactive patients (MOGE'd).
 - Most clinics stated this was too time consuming.
 - Immunization Program is working on a resolution for this since this affects over-inflated county saturation coverage statistics.
 - Small increase of inactive patients was noted after study for these clinics.

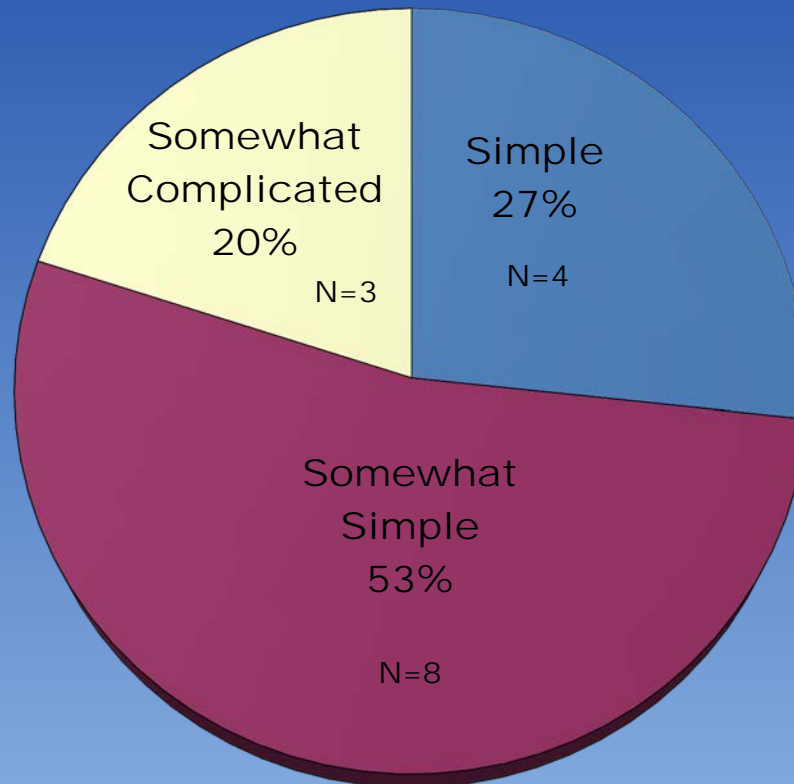
Results of Provider Survey

- How was the Quality of Training when learning how to use the Data Quality Reports?



Results of Provider Survey

- With Regard to Generating and Reading the Reports, How would You Rate the Ease of Use?



Results of Provider Survey

- How well has this Data Quality Project been Accepted?

Response Category	Response Percent	Response Count
Accepted	60.0%	9
Somewhat Accepted	40.0%	6
Somewhat Disapproved	6.7%	1
Disapproved	0.0%	0
No Comment	0.0%	0
Other (please specify)	6.7%	1

Survey Feedback

- Comments from Clinics
 - Increased their awareness and understanding of additional reports available in KSWebIZ.
 - Most liked the new IZ Data Quality reports.
 - Proud of their clinics level of data quality!
 - Indicated that the whole process was helpful.
 - Identified Data Quality excellence was reassuring and motivating.

Survey Feedback (cont'd)

- Comments (cont'd):
 - Will help me to weed out patients that are no longer seen at our clinic.
 - Will help us determine active patient numbers and if we need to look at MOGE data better.
 - Will help reception staff to take a closer look at completeness of registration information.
 - Shows us what we are not inputting.
 - Will help keep kids up to date.
 - Ensures that we chart in a timely manner.

Survey Feedback (cont'd)

- Comments (cont'd):
 - Helps us to check on mistakes/missed opportunities.
 - Helps the nurses pay closer attention to which vaccines are given at which ages.
 - Helps us give the right vaccines at the right time.
 - Will help us follow through with documentation.
 - Will help us to make sure that the registry is being updated after giving immunizations.

Survey Feedback (cont'd)

- Comments (cont'd):
 - Will facilitate gathering more information from patient for demographics.
 - Facilitated the education of staff on required data fields that needed to be input.
 - Helped us to identify bugs in our Patient Management/EHR system.

Future Plans

- Continue to work with pilot sites for the next six months.
- Continue to Capture Feedback for improvements.
- Make changes to the DQ tool as needed.
- Expand the use of the DQ tool to all KSWebIZ Clinics.
 - Training, Feedback, etc.
- Using the Tool, Monitor Data Quality on an ongoing basis.

Questions



Our vision is 'healthy Kansans living in safe and sustainable environments'. The state belongs to all of us - "Kansas Don't Spoil It"

Contact Information

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