WHIO Semi-Annual

Datamart Quality & Value Report:

Datamart Version 8

January, 2013

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Executive Summary

This report is an overview of key data quality metrics and is intended to provide the WHIO Board of Directors and other interested stakeholders with insight into the ongoing activities by WHIO to ensure quality and value of the WHIO Health Analytics Exchange.

In October, 2012, WHIO convened the multi-stakeholder WHIO Datamart Quality and Value workgroup. Comprised of a cross-section of WHIO's member organizations, the workgroup is committed to:

- ensuring the quality and usefulness of the WHIO Health Analytics Exchange by:
  - monitoring and measuring data accuracy and completeness from WHIO data contributors
  - developing and maintaining a common understanding and language to discuss data quality
  - establishing a forum where the workgroup can discuss methodologies deployed such as episode grouping, standard pricing, and risk adjustment, to voice questions, concerns, and suggestions for enhancements – and to do so with a representative cross-section of WHIO stakeholders.
- identifying needs for effective training and ongoing learning opportunities, including input to help shape training curricula, learning forums, and to provide feedback to our technology partner (Optum) as needed to ensure users at all levels of experience have the resources and contacts they need when they need them.
- maximizing stakeholder value.

The highly engaged workgroup has met three times, and intends to meet bimonthly in 2013. It is through this forum that WHIO will continue to address data quality and drive stakeholder value of the WHIO data and reporting tools.

OptumInsight, WHIO's technology vendor and partner, at the direction of WHIO performs numerous data validation and quality assurance checks for each datamart deliverable. It is through this process that issues in Data Contributor (DC) submissions have been identified. WHIO has made strides in working with each DC to address their specific challenges of submitting complete, accurate, and timely data that fully conforms to WHIO's and OptumInsight's standards and specifications. In each case where gaps are present, WHIO engages with the DC to fully understand any limitations of administrative data capture, storage, and submission.

Each section of this report is intended to focus on a critical aspect of datamart quality and value: inputs and content; accuracy and processing results; scope of data available; and functionality/enhancements.

Section I: Content of the Datamart

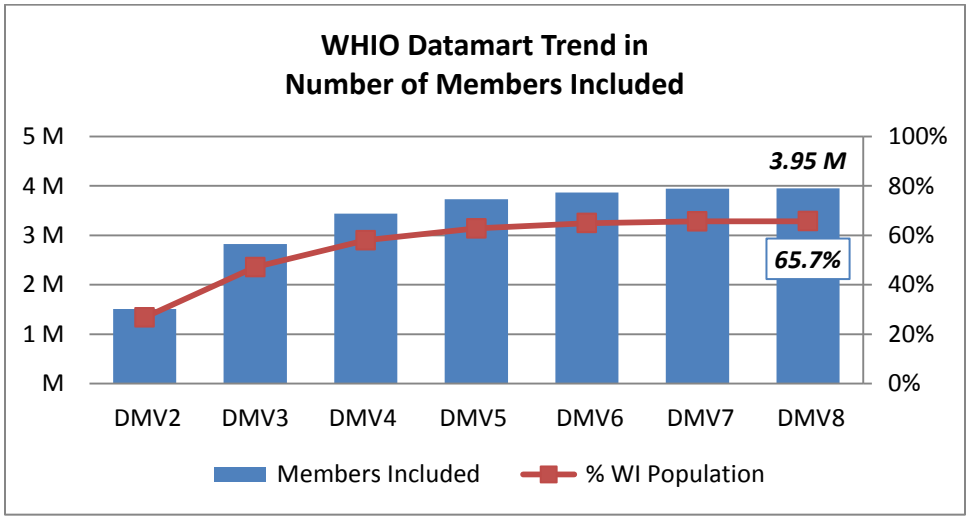
A. Trends in Datamart Content

The WHIO Datamart is produced twice per year, in April and October, and has had new data contributors with each release through Datamart Version 7. The following table depicts the chronology of datamarts 2 through 8, and includes summary measures for claim volume, payer mix, and percent capture of Wisconsin population.

	DMV2	DMV3	DMV4	DMV5	DMV6	DMV7	DMV8
Members Included	1.51 M	2.82 M	3.44 M	3.73 M	3.86 M	3.94 M	3.95 M
%WI Population	26.8%	47.1%	58.0%	62.8%	64.9%	65.6%	65.7%
Claims Included	72.7 M	136.8 M	207.1 M	233.5 M	247.6 M	249.6 M	247 M
% Commercial Claims	92%	52%	40%	42%	42%	42%	40%
% Medicaid FFS Claims	0%	42%	29%	26%	25%	24%	24%
% Medicaid HMO Claims	0%	0%	20%	19%	20%	20%	22%
% Medicare Claims	8%	6%	11%	13%	13%	14%	14%
Claim $ Included (Std. Cost/ Billed)		**$20.7 B / $35.7 B**	**$28.9 B / $51.6 B**	**$32.2 B / $59.3 B**	**$34.4 B / $64 B**	**$35.7 B / $66 B**	**$36.8 B / $67.5 B**
Episodes of Care	7.3 M	11.1 M	18.8 M	21.5 M	23.1 M	23.7 M	23.9 M
Providers Included		133,845	88,171	93,245	95,214	98,278	90,956
	10/2006 - 12/2008	10/2007 - 12/2009	4/2008 - 6/2010	10/2008 - 12/2010	4/2009 - 6/2011	10/2010 - 12/2011	4/2010 - 6/2011
Datamart Published:	**October, 2009**	**April, 2010**	**October, 2010**	**April, 2011**	**October, 2011**	**April, 2012**	**December, 2012**

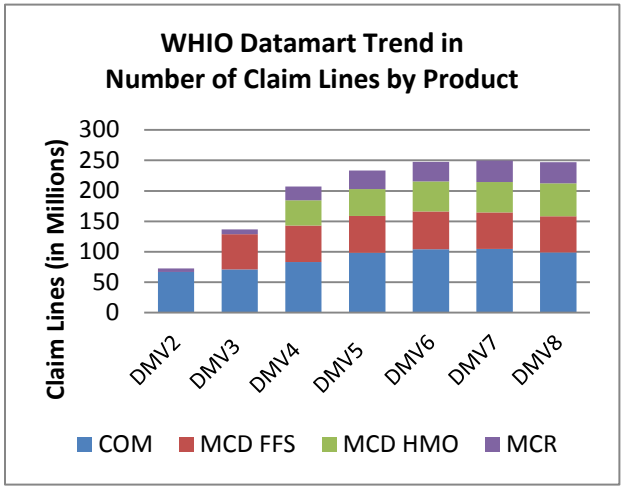
Original Data Contributors	New data contributors added					
	DMV3	DMV4	DMV5	DMV6	DMV7	DMV8
Anthem	WI Medicaid (FFS)	WI Medicaid (HMO)	Network HP	Health Traditions	The Alliance	*No new data contributors*
Humana	Gundersen Lutheran	Dean	Physicians Plus	Unity		
UHC WI		Security				
WEA		MercyCare				
WPS		GHC-SW				

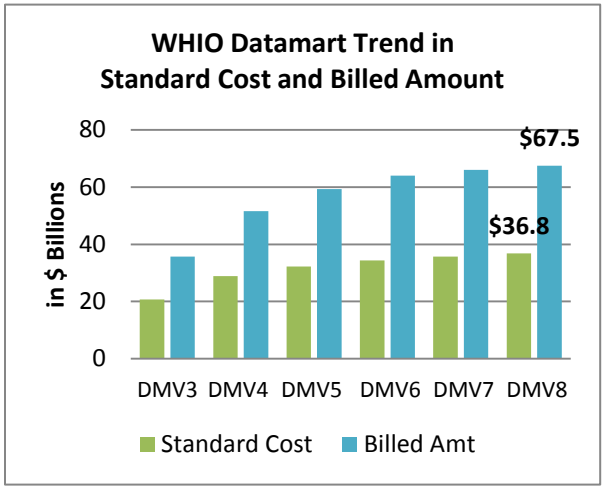
WHIO released its eighth datamart, or DMV8, in November, 2012. Due to data submission issues from WHIO data contributors in July, there was a delay in deploying the data processing engine within the expected timeline, and thus the datamart was delivered slightly behind schedule. (For a synopsis of DMV8 data submission issues refer to Appendix 4.) Additionally, there were new peer definitions introduced that required a second run of the processing engine, resulting in the final DMV8 deliverable being published in December, 2012. (New DMV8 peer definitions are discussed in Section IV of this report.) There were no new data sources or data contributors.



The percent-capture of the WI population has reached nearly two-thirds and has stabilized. The missing one-third of the Wisconsin population is comprised of Medicare fee-for-service lives, self-funded employers whose TPAs do

not submit data to WHIO, and those commercially insured by bordering state or national insurance plans that do not participate in WHIO (e.g. HealthPartners, Medical Associates, Aetna, Cigna), and the uninsured.



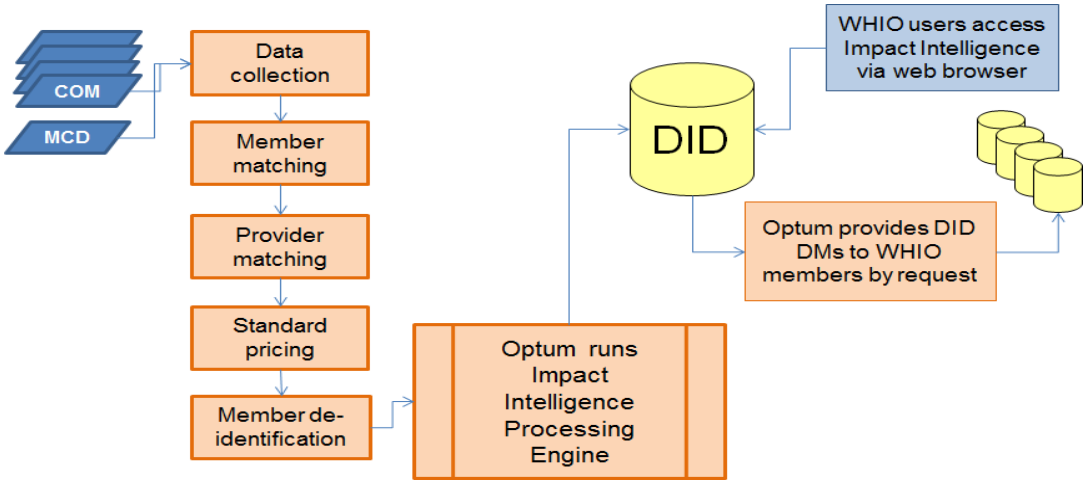


DMV8 contains 247 million claim lines. Once WHIO began receiving all of Wisconsin Medicaid claims in DMV4, the main source of growth in claims volume has been from commercial plans joining WHIO as data contributors. In DMV8, there was a slight overall decline of 1% from DMV7 in the volume of claims submitted by data contributors, driven primarily by Commercial claims, and a slight decline in Medicare Advantage/Supplemental claims.

The data in DMV8 represent $67.5 billion in billed charges incurred over 27 months for medical and pharmacy services, which translates to $36.8 billion in standardized cost. WHIO standardized cost is a methodology applied to measure and compare resource use and intensity by applying a normalized fee schedule across all types of service.

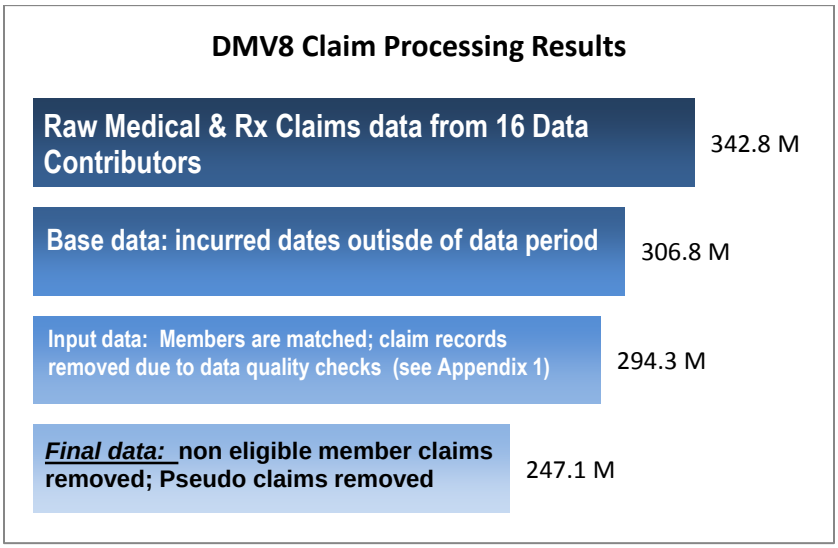
B. Claim Volume and Grouping Results

The graphic below depicts the data collection, aggregation, and processing steps and datamart production processes performed by OptumInsight on behalf of WHIO. The "DID" represents the de-identified datamart that is generated as a result of the many data processing steps that precede it in the flow chart. It is this roughly 3 terabyte SQL server datamart that underlies the Impact Intelligence web-based rfeporting system, and which is available to be provided to WHIO member and subscriber organizations upon request.



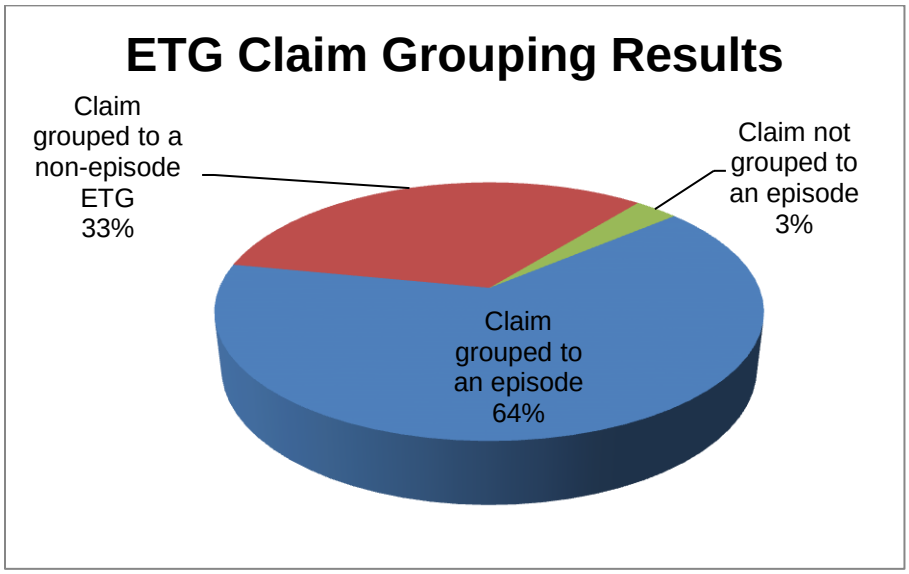
There are numerous processes throughout data aggregation that refine the result set. The bar chart below indicates the number of claim lines after each refinement step during processing. The data quality rules imposed that result in the removal of claim records are described in greater detail in Appendix 1.

1. Claims processing results



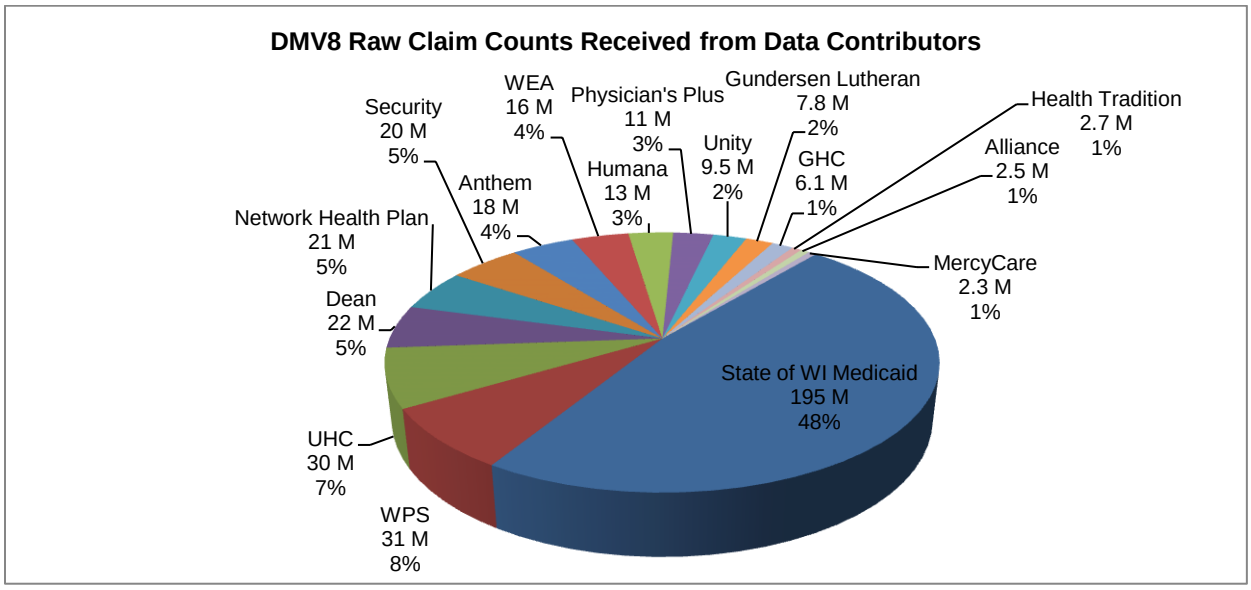
2. Summary of claims grouped to an episode of care

The chart below summarizes the results of grouping claims into ETG episodes of care. An ungrouped rate of 3% is in the expected range for ETG grouping results. The mix between episodes and non-episodes is also in the expected range (non-episodes are considered as such due to the lack of a patient-clinician encounter such as in ongoing prescription drug maintenance).

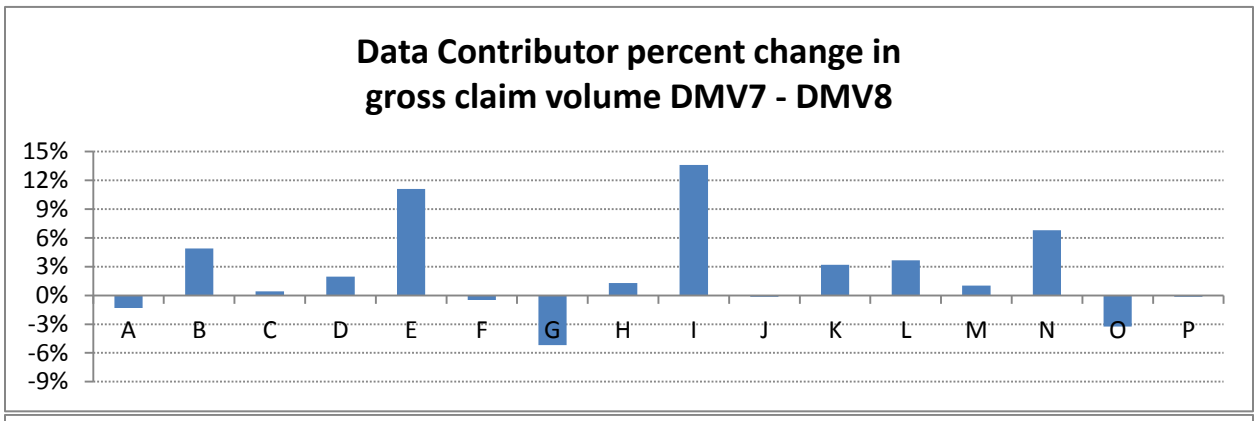


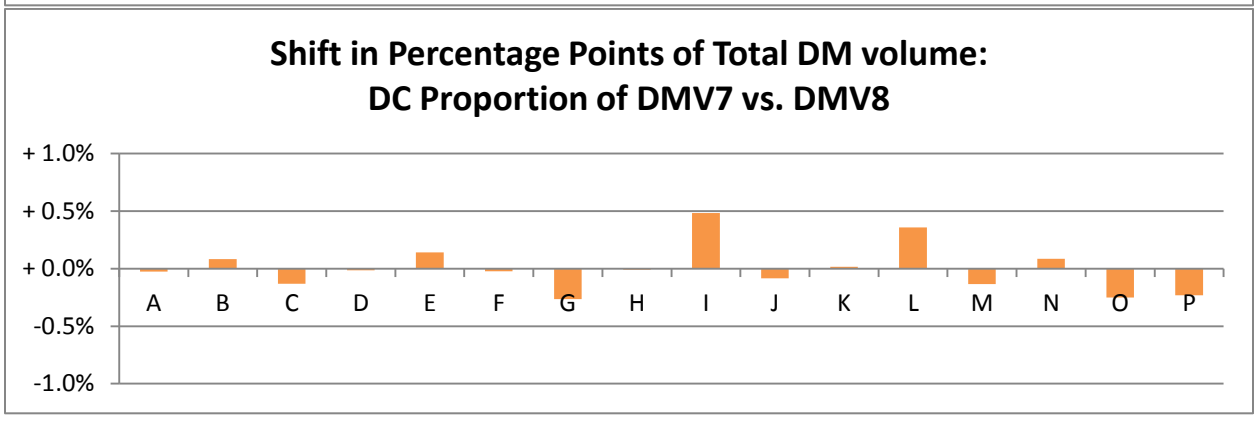
3. Summary of claims volume by data contributor

The following chart summarizes the total number of raw claim lines received for DMV8, submitted to OptumInsight by WHIO data contributors.



The following charts compare data contributor claims submission from DMV7 to DMV8. There is less than 0.5% change, increase or decrease, in data contributor proportion of claim volume in each datamart.





C. Completeness and Accuracy of Field-level data in Data Contributor field Submissions

After each datamart production cycle, OptumInsight reports on data gaps and quality issues that were identified as significant in Phase 0 at an aggregate level, as well as on any new gaps or issues that have arisen in processing the production deliverables. WHIO and OptumInsight are collaborating with all data contributors on an ongoing basis to resolve any gaps or issues that affect their data. The table below provides the list of data quality issues being tracked and their current status at an aggregate level.

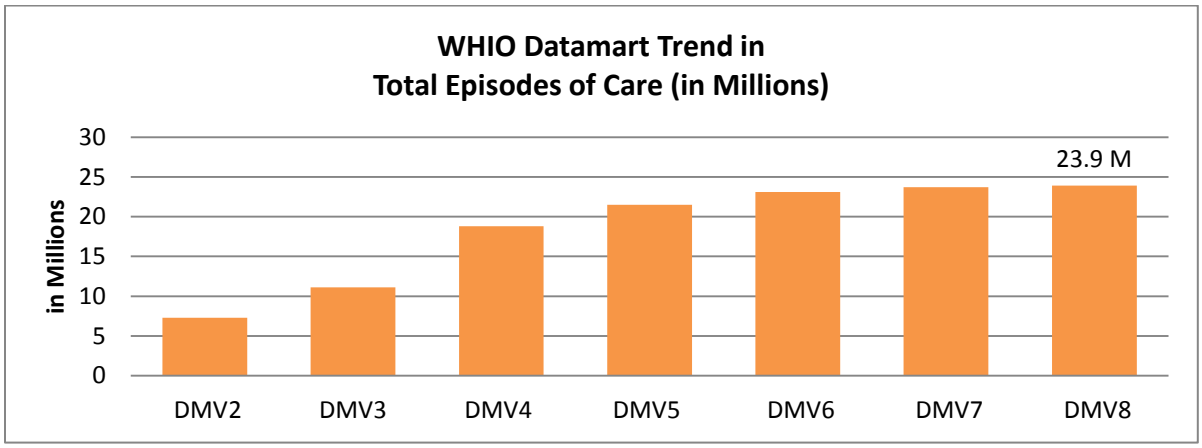
Data issue	Current Status
All commercial, fully-insured WI members and claims received, including claims for services rendered outside of WI	Received from all data contributors
All other WI members and claims, or non-WI members and claims that were serviced by a WI provider received	Varies by data contributor and type of data. In general, these special data types have been challenging to submit and, in some cases, remain gaps currently.
Member Matching fields received on all eligibility records	Received, in general, from all data contributors although specific fields (e.g., SSN) may vary. See the WHIO Member Matching Summary section for member matching results.
Pharmacy benefit flag received on all eligibility records	Received from all data contributors although is hardcoded to N for DCs where Pharmacy claims are not available to send
Corresponding eligibility records received for all claims received	Match rate of members found on claims to eligibility > 99% for all data contributors.
Denied claims received and identified	Received from 13 of 16 data contributors
Secondary-payer claims received and identified	Received from all data contributors, although they are not identifiable on pharmacy data for one data contributor.
Billed Amount received on all claims	Received from all data contributors, although it is $0 on portions of data. In the WHIO data mart Billed Amount is >$0 on >99% and 99% of paid medical and pharmacy claim lines, respectively.
Servicing Provider received on all claims	True Servicing Provider fill rate varies by data contributor, but 100% of claims in the WHIO data mart have a Servicing Provider (94% used Servicing Provider with provider information available, 6% used Billing Provider with provider information available., 2% used Servicing Provider with ID only and 0% used Billing Provider with ID only).
Servicing Provider Specialty received on all claims	Varies by data contributor, but is populated 100% in the WHIO data mart (<1% of records are populated as “Other” or “Unclassified”).
Prescribing Provider received on all Rx claims	Varies by data contributor from 0% -100%
Provider Matching fields received on all provider records	Varies by data contributor and field. Fill rate of required fields provider name and street address was >99% for 14 of 16 data contributors. Other data contributors had fill rates from 94% - 98%. See the WHIO Provider Matching Summary section for provider matching results.
NPI received on all eligible provider records	Varies by data contributor from 38% - 98% (72% - 99% for individuals). In general, fill rates are improving as historical data cycles off.
Provider Specialty received on all provider records	Varies by data contributor. Post-provider matching, provider specialty is populated >99% in the WHIO data mart (2% of records are populated as “Other” or “Unclassified”).

For a detailed description of each issue listed above, please refer to Appendix 1, the WHIO DMV8 Data Summary Report. Specific data quality and completeness results for these measures for DMV8 data submissions by Data Contributor (blinded) can be found in Appendix 2, the WHIO DMV8 Data Contributor Activity Summary.

D. Number of Episodes

1. Number of Completed Episodes

The bar chart below summarizes the total number of episodes (in millions) grouped in each WHIO datamart since DMV2.



2. Episodes used for provider measurement in PNA

One of the capabilities of the WHIO Reporting System is producing detailed provider performance measurement reports, informally referred to as Buck E. Badger reports. These are produced using the Impact Intelligence module known as Provider Network Assessment, or PNA. During datamart processing, the software – based on numerous rules and configuration settings – identifies a clinically relevant, homogeneous subset of episodes which become the basis of PNA provider measurement.

The following list is the core set of currently available peer group definitions for WHIO provider measurement. In addition to this set there are permutations of this core set that enable payer type-specific peer group comparisons (excluding Medicaid members; only Medicaid members), regional primary care peer group comparisons according to the five Brookings/Dartmouth Wisconsin regions, and three population-based imputed primary care physician peer groups.

WHIO PCP (Family)
WHIO PCP (Internal Medicine)
WHIO PCP (Pediatric)
WHIO Cardiology
WHIO Dermatology
WHIO Endocrinology
WHIO Gastroenterology
WHIO Hematology/Oncology
WHIO Chiropractics
WHIO General Surgery
WHIO Interventional Cardiology
WHIO Obstetrics/Gynecology
WHIO Orthopedics
WHIO Otolaryngology
WHIO Urology
WHIO Neurology
WHIO Psychiatry
WHIO Allied Behavioral Health (Non-MD)
WHIO Spine
WHIO Nephrology
WHIO Neurosurgery

There are specific types of episodes that, though they are all available for a wide spectrum of analyses in the reporting system, are intentionally not included in PNA provider measurement. These types include 1) ETGs where there is a significant volume of low cost, low variability episodes that would introduce noise into the measurement of resource use (examples include Routine Exam and Ongoing Prescription Drug therapy); 2) ETGs with low

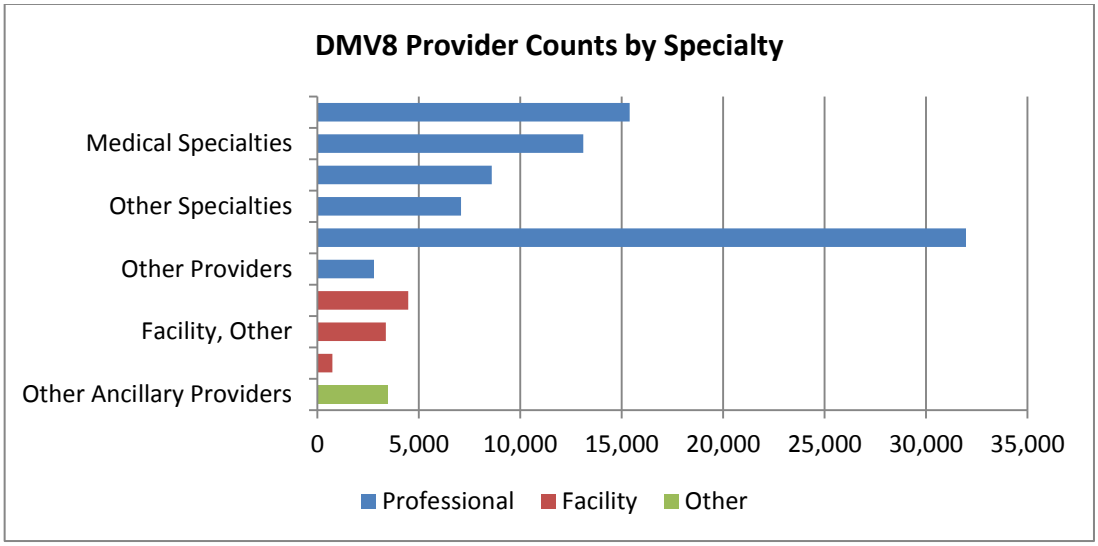
frequency highly variable episodes with respect to resource use and/or outcomes (e.g. organ transplant or other highly specialized surgical techniques used by a small number of providers); and 3) ETGs for "signs and symptoms" episodes of a particular condition or body system, where the treatment does not align with a predictable standard of care. It should also be noted that all incomplete episodes and low-cost outliers are excluded in provider measurement. High-cost outliers episodes are included but truncated at a cost threshold configured for each ETG based on statistical trim points.

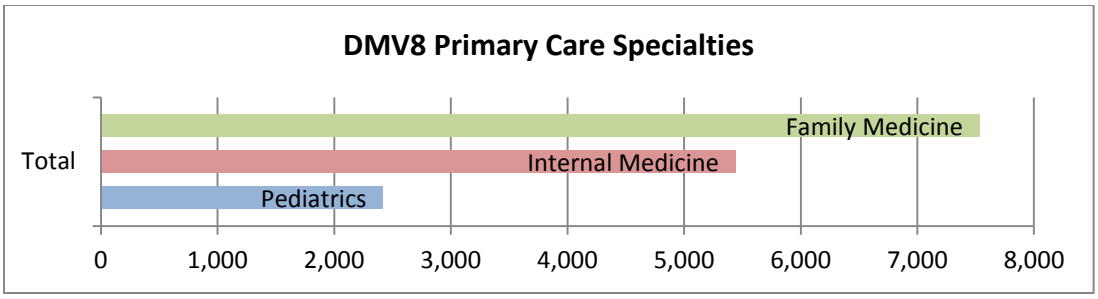
The quantity of total grouped episodes that are used in provider measurement (PNA) has been a source of vocal concern and misunderstanding in the past, specifically that episodes used in PNA measurement account for only 12-15% of the total number of grouped episodes (23.9 million) in the datamart. What is often lost in translation is that roughly half (49%) of all episodes are not considered for PNA simply due to their timing: PNA considers only episodes that are completed during the most recent 12 months. This is a feature of the current version of the Impact Intelligence software. The migration to Impact Intelligence v 2.0 in the spring of 2013 will enable the use of episodes in both 12-month periods for episode-based provider measurement. Additionally, after removing low-cost outliers and incomplete episodes from the relevant reporting period, the pool of eligible episodes for provider measurement is 33%. Applying further refinements to select only relevant ETGs to each specialty group, and select only those episodes where clear majority thresholds are met for attribution of responsibility to a provider or group, the end result is the 12-15% of total grouped episodes.

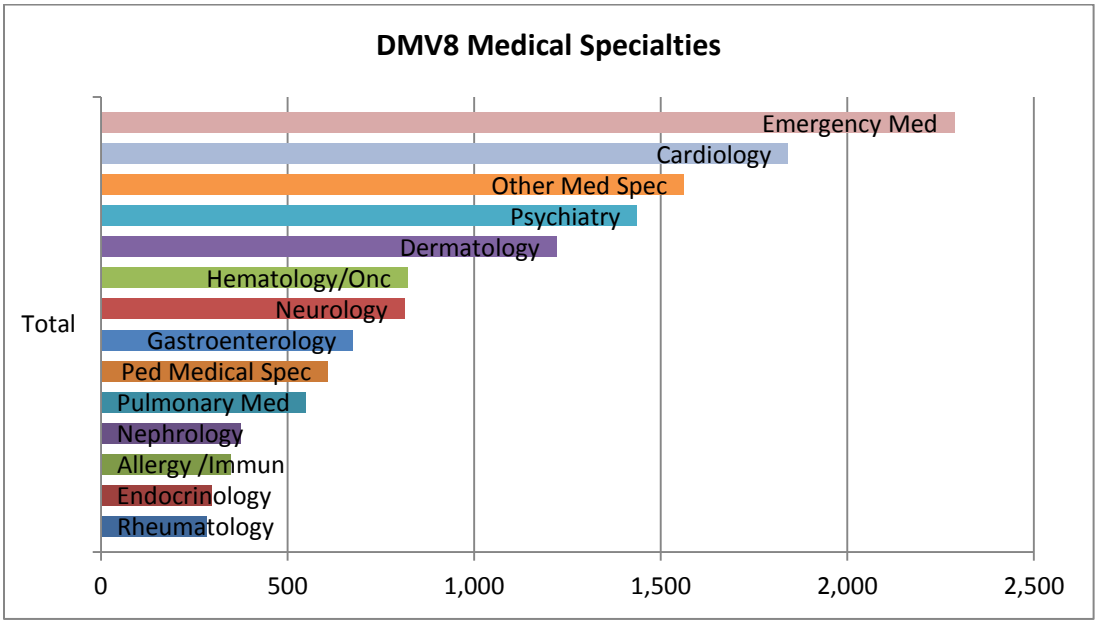
The criteria applied to narrow the episodes used in PNA measurement is intended to filter the universe of episodes, all of which remain available for analysis in other parts of the reporting system, to a meaningful subset from which to calculate valid performance measures for fair peer group comparisons.

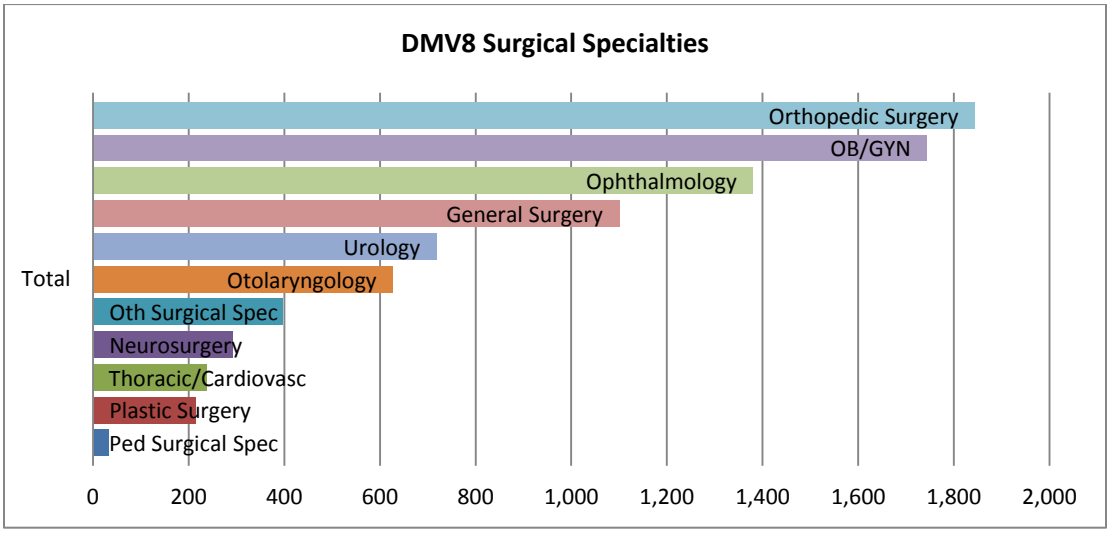
E. Number of Providers by Specialty

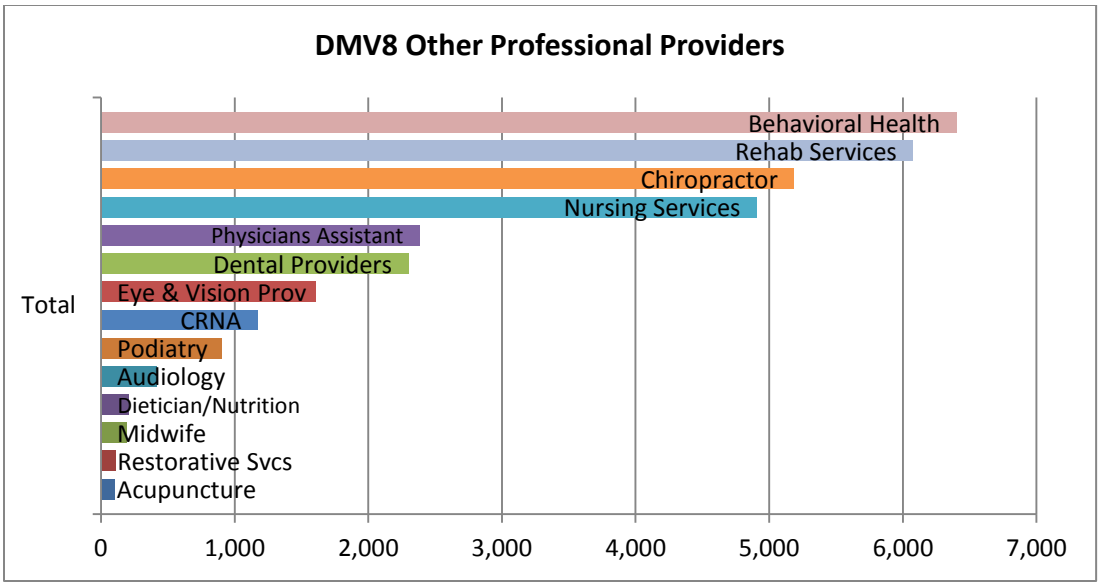
The charts that follow depict the number of providers across all specialties, physician and non-physician, in DMV8.

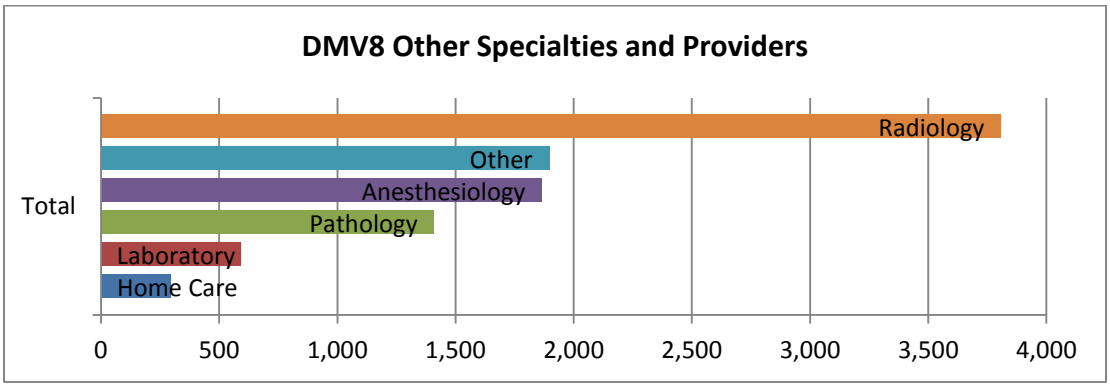



DMV8 Primary Care Specialties
Total
Family Medicine
Internal Medicine
Pediatrics
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000


DMV8 Medical Specialties
Total
Emergency Med
Cardiology
Other Med Spec
Psychiatry
Dermatology
Hematology/Onc
Neurology
Gastroenterology
Ped Medical Spec
Pulmonary Med
Nephrology
Allergy /Immun
Endocrinology
Rheumatology
0
500
1,000
1,500
2,000
2,500


DMV8 Surgical Specialties
Total
Orthopedic Surgery
OB/GYN
Ophthalmology
General Surgery
Urology
Otolaryngology
Oth Surgical Spec
Neurosurgery
Thoracic/Cardiovasc
Plastic Surgery
Ped Surgical Spec
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000





Section II: Accuracy of the Data Mart

F. OptumInsight Quality Assurance processes

At WHIO's request, OptumInsight has provided a summary document that describes the quality assurance processes that their technical team employs in aggregating, matching, and grouping WHIO data. Optum processes include quality assurance procedures and processes through-out the datamart processing for WHIO. The key steps in the WHIO processing include:

- New data contributor implementation and testing,
- File validations upon receipt of data contributor files,
- Provider matching processing and validations,
- Data warehouse processing and validations,
- Processing engine processing and validations,
- Physician review, and
- Post process reporting.

Each of these steps in the WHIO datamart processing includes a detailed set of quality checks which are outlined in the Optum report in Appendix 5.

G. Provider, Member and Facility Matching Rates

As WHIO's data aggregator, OptumInsight consumes data feeds from 16 payer data contributors as well as from the Wisconsin Medical Society and the Wisconsin Hospital Association. These data are pooled, and matching algorithms are applied for members, providers, and hospitals, so as to represent individual members and providers uniquely in each datamart. A detailed description of the matching processes, as well as summary statistics from DMV8, are available in Appendix 1.

Section III: Scope of the Data Mart

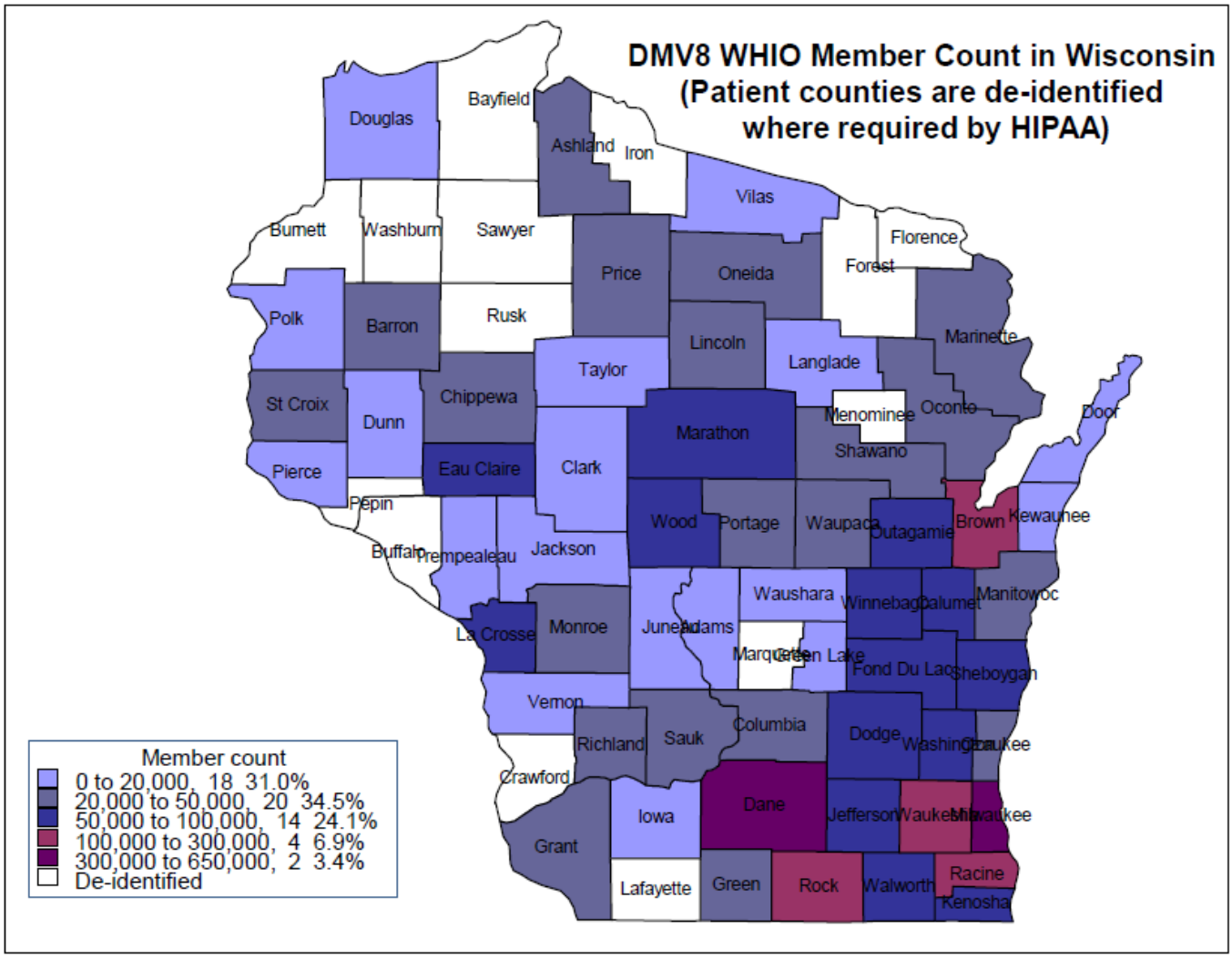
H. Penetration/Coverage of Population by County

The table below is a crosswalk that summarizes the Wisconsin counties that are de identified in WHIO data based on HIPAA privacy criteria. Yellow-shaded counties are those where that population is allocated to a different county based on the population in their 3-digit zip code.

True WI County	3-digit zip code	WHIO de-identified County
Adams	539	Adams
	546	La Crosse
Ashland	548	Ashland
	545	Price
Barron		Barron
Bayfield		Ashland
Brown		Brown
Buffalo	547	Eau Claire
	546	La Crosse
Burnett		Ashland
Calumet		Calumet
Chippewa		Chippewa
Clark		Clark
Columbia		Columbia
Crawford	538	Grant
	546	La Crosse
Dane		Dane
Dodge		Dodge
Door		Door
Douglas		Douglas
Dunn		Dunn
Eau Claire		Eau Claire
Florence		Brown
Fond Du Lac		Fond Du Lac
Forest	541	Brown
	545	Price
Grant		Grant
Green		Green
Green Lake		Green Lake
Iowa		Iowa
Iron		Price
Jackson		Jackson
Jefferson		Jefferson
Juneau		Juneau
Kenosha		Kenosha
Kewaunee		Kewaunee
La Crosse		La Crosse
Lafayette	538	Grant
	535	Richland
Langlade		Langlade
Lincoln		Lincoln
Manitowoc		Manitowoc
Marathon		Marathon
Marinette		Marinette
Marquette	539	Adams
	549	Fond Du Lac
Menominee	541	Brown
	544	Portage
Milwaukee		Milwaukee
Monroe		Monroe
Oconto		Oconto
Oneida		Oneida
Outagamie		Outagamie
Ozaukee		Ozaukee
Pepin		Eau Claire
Pierce		Pierce
Polk		Polk
Portage		Portage
Price	544	Portage
	545	Price
Racine		Racine
Richland	539	Adams
	546	La Crosse
	535	Richland
Rock		Rock
Rusk	548	Ashland
	547	Eau Claire
	545	Price
Sauk		Sauk
Sawyer		Ashland
Shawano		Shawano
Sheboygan		Sheboygan
St. Croix		St. Croix
Taylor		Taylor
Trempealeau		Trempealeau
Vernon		Vernon
Vilas		Vilas
Walworth		Walworth
Washburn		Ashland

1. Population by Patient County

Member PHI, including zip code of residence, is de-identified in the WHIO datamart. Thus, it is not possible at this time to produce a true county-level population distribution for the WHIO member population. However, the two county-level maps below provide a visual of member counts and relative retrospective member-risk (a measure of financial risk based on 12 months of medical claims experience), using the WHIO de-identified member county.

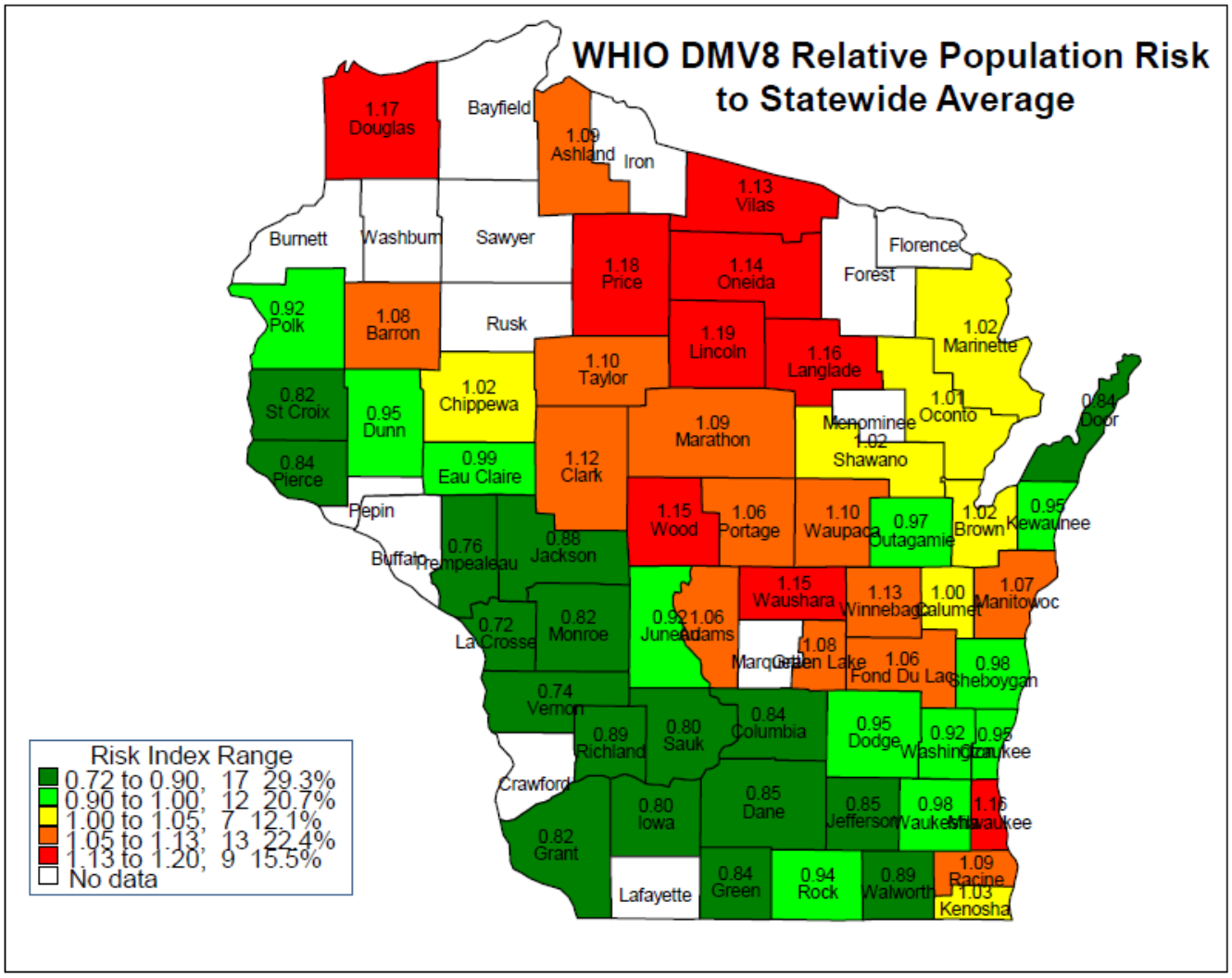


2. Population Risk by Patient County

Impact Intelligence uses Symmetry Episode Risk Groups (ERGs) as the basis to measure the overall morbidity of individuals and populations. ERGs are used for risk adjustment and for trending risk across time periods.

This risk model measures expected resource use and is referred to as relative health risk, or "illness burden" of a population. Risk is measured in reference to a standard population assigned a risk score of 1.00. An individual or group with a risk score of 1.15 is expected to use 15% more health care resources than the population average.

Diagnosis-based methods, like ERGs, utilize claims data for a given timeframe (typically one-year) and classify members using "grouping" algorithms that define the member's clinical risk profile, based upon provider-submitted diagnoses. Each member is assigned a risk score based on this clinical profile and its expected impact on medical costs.

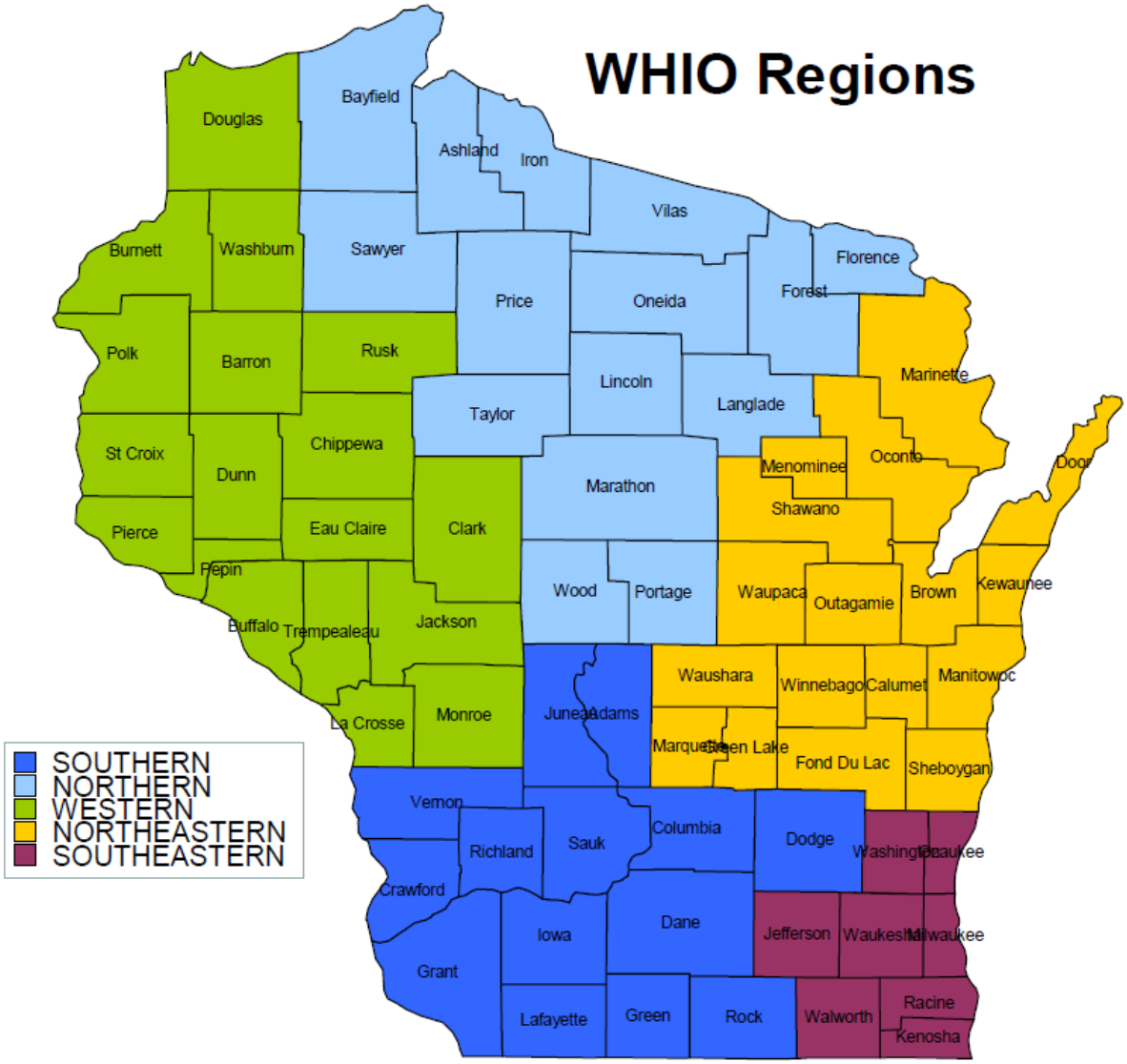


Section IV: Functionality of the Data Mart

I. Enhancements to Provider Measurement Peer Group definitions

For DMV8, WHIO introduced several enhancements in primary care provider peer definitions. These included three population-based imputed PCP peer definitions (Family Medicine, Internal Medicine, and Pediatrics), and 15 episode-based regional peer definitions (the three primary care peer types for each of five Wisconsin regions). Adding the population-based imputed PCP peer definitions will allow users to analyze total member cost of care and population-based measures (utilization per 1,000 members and Per Member Per Month standardized costs across the spectrum of health care service categories) for members where a PCP can be imputed using their claims data. The episode-based regional peer definitions will enable users to benchmark individuals and groups of providers to a regional peer group norm, in addition to the statewide peer group norm. The five county-based regions used in the new primary care peer groups are listed in the following table. These are consistent with the Brookings-Dartmouth geographical regions.

There are some provider specialties for which WHIO does not currently have provider measurement peer groups defined, but which are under consideration for peer group development in future datamarts (e.g. Pulmonology). A peer group to evaluate the specialty of Ophthalmology will be introduced with WHIO datamart version 9 in the spring of 2013. Also under consideration is the development of provider peer groups to measure mid-level primary care providers. The criteria that are considered when establishing peer groups for provider measurement are: sufficient episode volume where there are evidence-based standards of care and the majority of care in an episode can be attributed to the specialty; a large enough sample of like providers to ensure statistical validity; and the availability of vetted and endorsed process quality measures to compare quality compliance.



NORTHEASTERN	NORTHERN	SOUTHEASTERN	SOUTHERN	WESTERN
BROWN	ASHLAND	JEFFERSON	ADAMS	BARRON
CALUMET	BAYFIELD	KENOSHA	COLUMBIA	BUFFALO
DOOR	FLORENCE	MILWAUKEE	CRAWFORD	BURNETT
FOND DU LAC	FOREST	OZAUKEE	DANE	CHIPPEWA
GREEN LAKE	IRON	RACINE	DODGE	CLARK
KEWAUNEE	LANGLADE	WALWORTH	GRANT	DOUGLAS
MANITOWOC	LINCOLN	WASHINGTON	GREEN	DUNN
MARINETTE	MARATHON	WAUKESHA	IOWA	EAU CLAIRE
MARQUETTE	ONEIDA		JUNEAU	JACKSON
MENOMINEE	PORTAGE		LAFAYETTE	LA CROSSE
OCONTO	PRICE		RICHLAND	MONROE
OUTAGAMIE	SAWYER		ROCK	PEPIN
SHAWANO	TAYLOR		SAUK	PIERCE
SHEBOYGAN	VILAS		VERNON	POLK
WAUPACA	WOOD			RUSK
WAUSHARA				ST. CROIX
WINNEBAGO				TREMPEALEAU
				WASHBURN

J. Amount, Frequency and Cause of "Downtime"

Availability of the Impact Intelligence application for WHIO

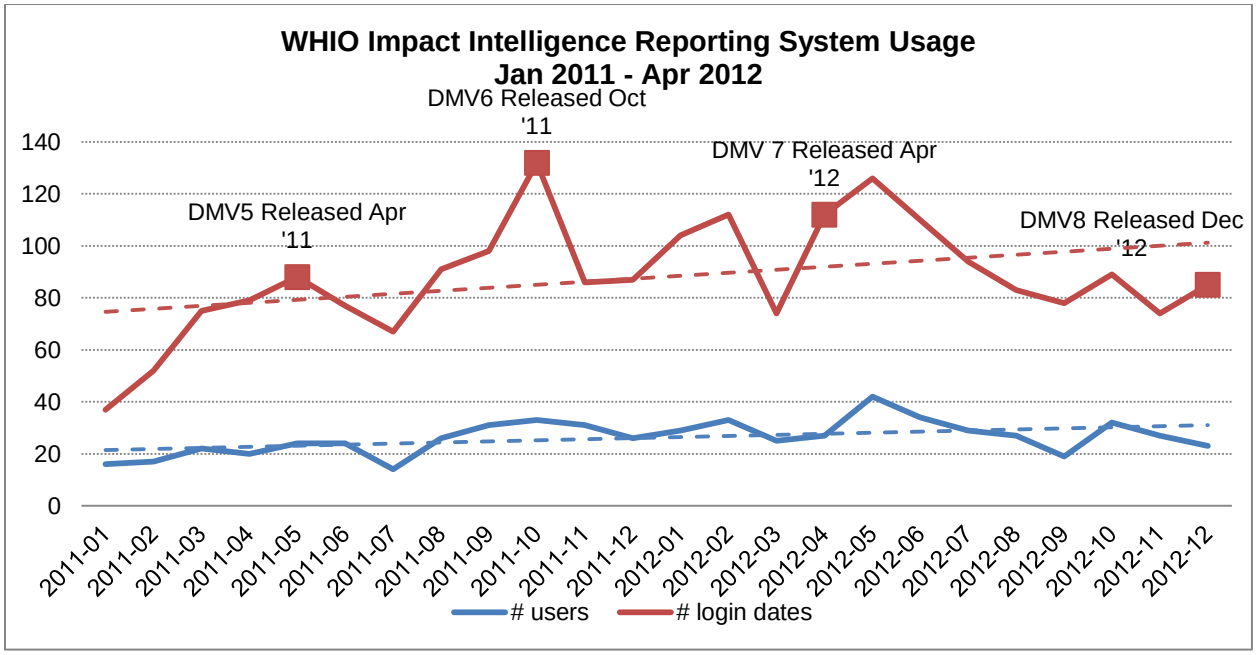
Month	# of Incidents	# of Scheduled hours of Availability	Scheduled Availability in Minutes	Full Outage in Minutes	% Uptime	Partial Outage in Minutes	% Partial Impact	Total User Impact Minutes	%Full Availability
Jan - 2012	1	744	44640	300	99.33	0	100.0	300	99.33
Feb - 2012	1	696	43200	200	99.54	0	100.0	200	99.54
Mar - 2012	2	744	44640	420	99.06	0	100.0	420	99.06
Apr - 2012	2	720	43200	1740	95.97	0	100.0	1740	95.97
May - 2012	1	744	44640	300	99.33	0	100.0	300	99.33
Jun - 2012	1	720	43200	300	99.31	0	100.0	300	99.31
Jul - 2012	1	744	44640	300	99.33	0	100.0	300	99.33
Aug - 2012	1	744	44640	300	99.33	0	100.0	300	99.33
Sep - 2012	1	720	43200	680	98.43	0	100.0	680	98.43
Oct - 2012	1	744	44640	360	99.19	0	100.0	360	99.19
Nov - 2012	1	720	43200	360	99.17	0	100.0	360	99.17
Dec - 2012	1	744	44640	300	99.33	0	100.0	300	99.33

K. Help Desk Log & Status

Optum Client Support provides help desk services by phone and email for WHIO users when technical issues arise, and to answer product-specific or methodological questions about Impact Intelligence and its components. Help desk tickets are created for each user inquiry. These are tracked by Optum and reviewed with WHIO on bi-weekly update calls. For a detailed list of both closed and open Help Desk issues, refer to Appendix 3.

L. Usage Report

Through January, 2013, WHIO has registered about 240 Impact Intelligence Users. Of all users who have been registered, 200 users have an "active" status. Note that 24 of those active user IDs are registered to Optum staff.



The usage of Impact Intelligence generally increases in the month of and following each datamart release.

At this time, WHIO does not have the ability to measure direct usage of the physical copy of the datamart that member and subscriber organizations can request from Optum and store within their own business intelligence environment. Currently there are four member organizations that utilize the physical datamart, and several others that are considering making the investment in infrastructure to do so.

Appendices:

Appendix 1: DMV8 Data Summary Report

Appendix 2: WHIO Data Contributor Activity Summary

Appendix 3: Help Desk Ticket Log

Appendix 4: DMV8 Data Submission Issues

Appendix 5: OptumInsight Quality Assurance Processes report