

# Utilization Patterns In a Rural School-based Telemedicine Program: A Three-year Analysis

Amanda Martin, MHA

Steve North, MD, MPH

Lacey Jones, BS

## Introduction:

The Health-e-Schools school-based telemedicine program began providing care at 3 schools in the fall of 2011. Since its inception, Health-e-Schools has grown to provide care at 33 schools in four school districts. The school nurses present the patient at the school and they are seen by a nurse practitioner or a family physician.

Since the Fall of 2014, following each visit, the provider has completed a survey to track information not easily captured in the electronic health record including:

- Demographic data
- Method of referral into the program
- Reason for the visit
- Need for an interpreter
- Parental and school involvement in the visit
- Did the child return to class or the staff member to work
- Necessity for follow-up
- Reliability of the equipment and connectivity

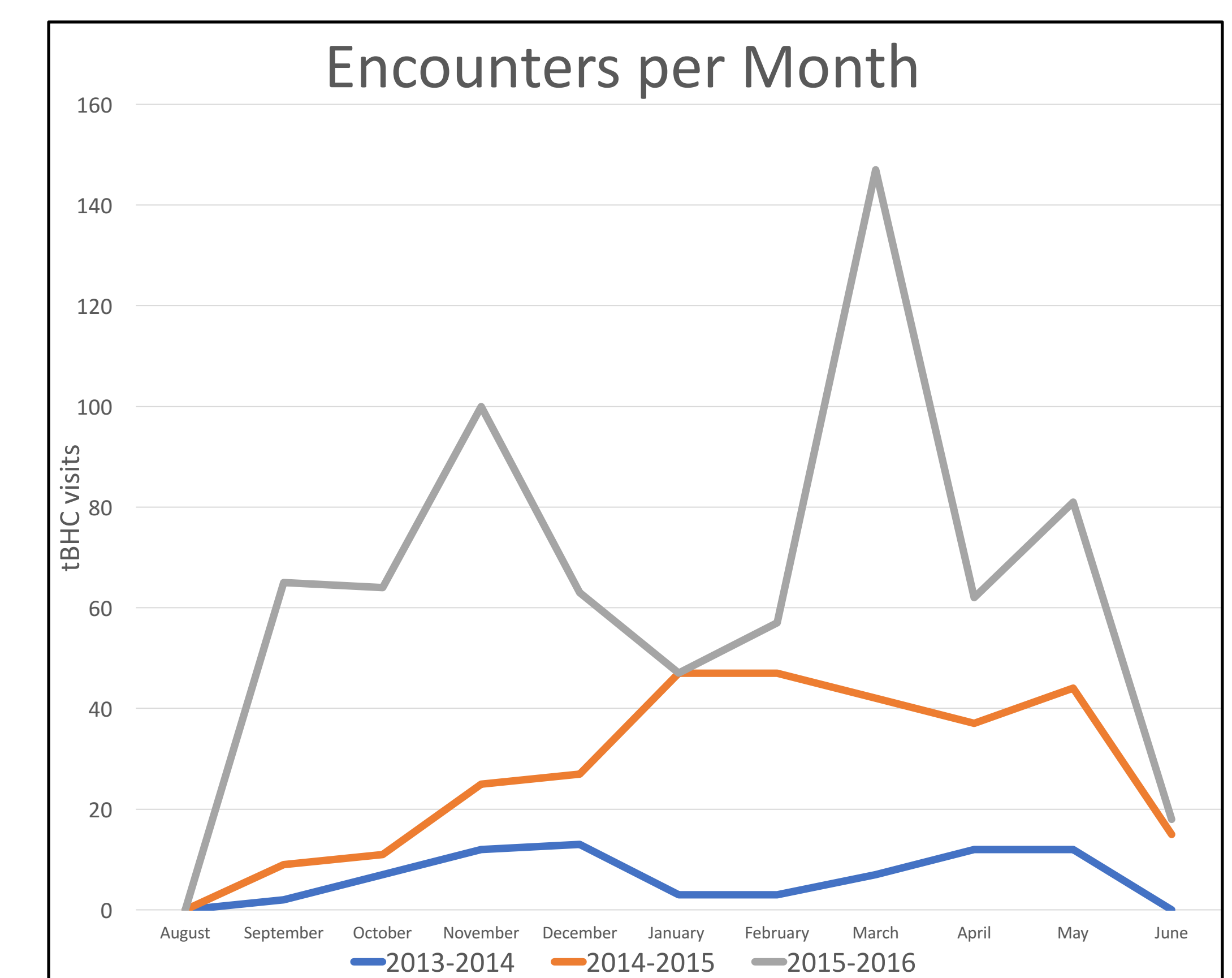
The survey is designed to measure the growth of the program, highlight areas for potential improvement including staffing, presenter engagement and utilization patterns.

Monthly variation in use of the program and overall growth of the program is illustrated in the graph to the right. Through this tracking we have identified the following trends:

While there was limited use in September 2014 and 2015 this was not seen in 2016 and is attributed to increased publicity and growing community experience with the program.

There is a high level of variability month to month that can be attributed to: preceding and following winter vacation; illness patterns (March 2016 = flu season); Spring Break (April 2015 and 2016); and, the availability of school nurses (although all schools start in August the nurses are not available to present until September).

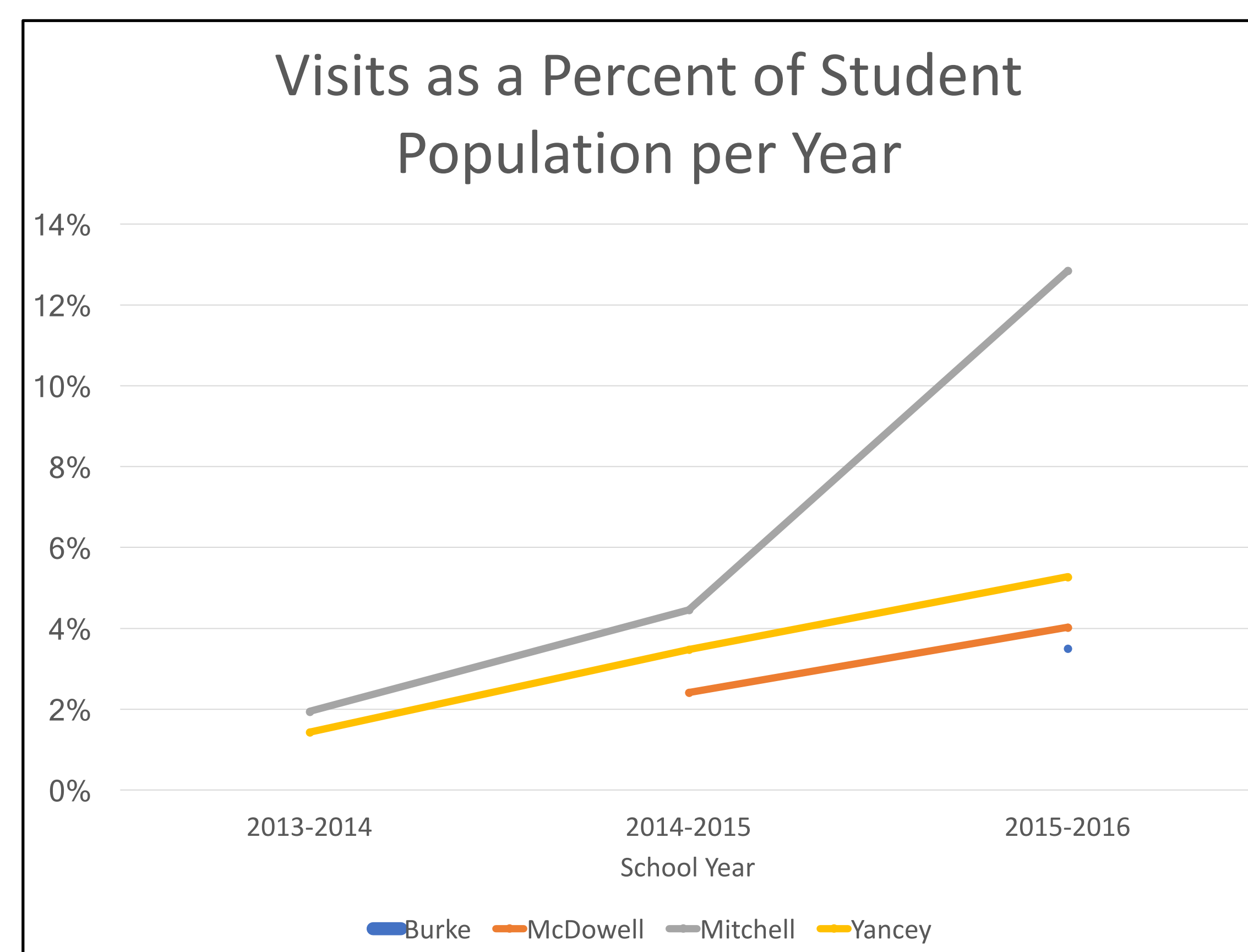
Not represented in the graph is the school and presenter level variation that we see. We have seen in each district that when a Health-e-Schools program director engages individual nurses there is an immediate, but not necessarily lasting, increase in visits presented by that nurse.



In fall 2013, both Mitchell and Yancey County Schools had 7 schools with telemedicine units. In fall 2014, McDowell County joined the network with 8 additional schools and in fall 2015, Burke County joined adding 6 schools to the network. In 2014 the primary provider changed from being a pediatric nurse practitioner to a family nurse practitioner resulting in the ability to see adult patients.

It is notable that the first year utilization rate in each of the new districts is higher than the first year utilization rate in the district launched the year before. We attribute this to growing community acceptance, optimization of the launch process and improved operational efficiencies across the organization.

We attribute Mitchell County's substantial increase in utilization in 2015-2016 to two of the three school nurses being new and their greater investment in the program resulting in increased advocacy and referrals.



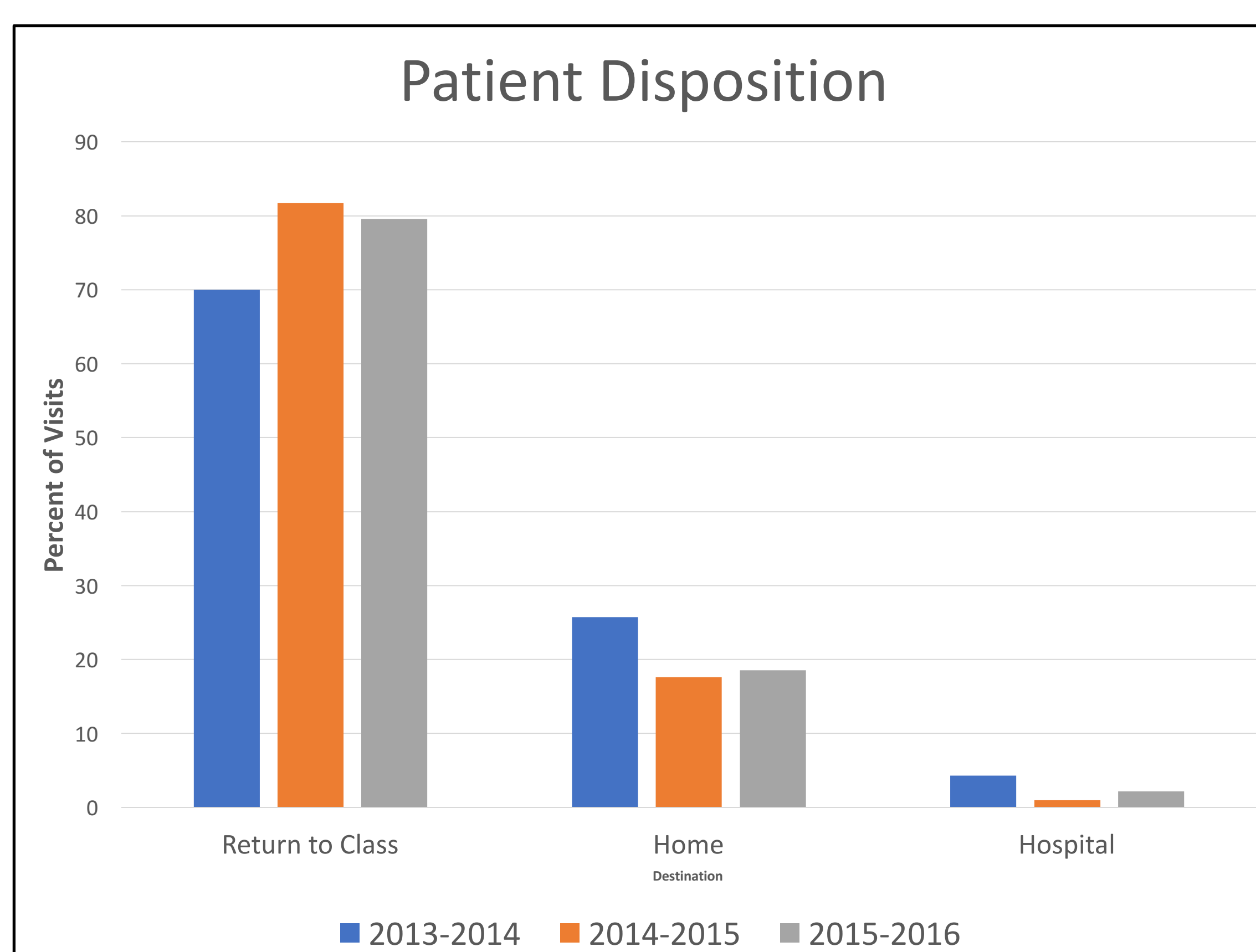
## Equipment and Connection Reliability

	Equipment			Connectivity		
	Worked	Problem but resolved	Problem ended visit	Worked	Problem but resolved	Problem ended visit
2013-2014	63.8	26.1	10.1	77.6	16.4	6.0
2014-2015	73.6	18.1	8.4	83.3	11.7	5.0
2015-2016	78.4	20.2	1.5	89.2	9.2	1.6

The reliability of telehealth equipment and the connectivity are distinct factors in the success and growth of a program. The Health-e-Schools program is operated by a small non-profit that does not have dedicated IT staff. Therefore, we frequently need to use the school district IT resources and our vendor's help desk for assistance in trouble shooting.

In 2013-2014 16.1% of our visits ended early due to equipment or connectivity issues. In 2015-2016 only 3.1% of visits were ended early due to equipment or connectivity issues. Multiple factors potentially contributed to these improvements:

- Improvements in telemedicine software and school district networks.
- Transitioning from a third-party customer support to manufacturer customer support during the 2015-2016 school year.
- The Health-e-Schools staff becoming more comfortable with trouble shooting and scheduled maintenance of the telehealth equipment.



Increasing school attendance is a major focus of school-based health centers nationally. In our rural communities, students who need to be seen by a physician or other health care provider frequently miss an entire school day due to transportation and timing issues. From an educational perspective, healthier students are better learners and, from a district financial perspective, each student absence prevented results in approximately \$80 in increased revenue. If 100 absences are prevented this results in an \$8000 increase in revenue based on average daily attendance (approximately 20% of the salary of a school nurse).

During the 2014-2015 and 2015-2016 school years, approximately 80% of students returned to class following their visit. Possible explanations for the lower rate in 2013-2014 include: the comfort level of the pediatric nurse practitioner vs. the family nurse practitioner; the level of illness seen; or, parental comfort with telehealth.

## Conclusions:

The results of the post-visit survey have provided significant insight into opportunities to improve the operation of our network. These findings are transferable to other programs as they design and grow both school-based telehealth programs and other telehealth programs.

The limitations of our survey are primarily related to the data being manually collected for each visit. Multiple software products exist that could expedite this process through integration with both the telehealth cart software and our EHR. However, due to our small budget, these are currently not feasible.

Future evaluation of our own and other school-based telehealth (tSBHC) programs can build on this work through: the integration of patient level clinical data, population health information and tSBHC utilization data; school level evaluation of tSBHC utilization and attendance, behavior issues and academic achievement; the impact of telehealth system reliability on tSBHC utilization; and, the impact of tSBHC programs on overall health care utilization in the community.