



# MONTANA ASTHMA HOME VISITING PROGRAM: REVIEW

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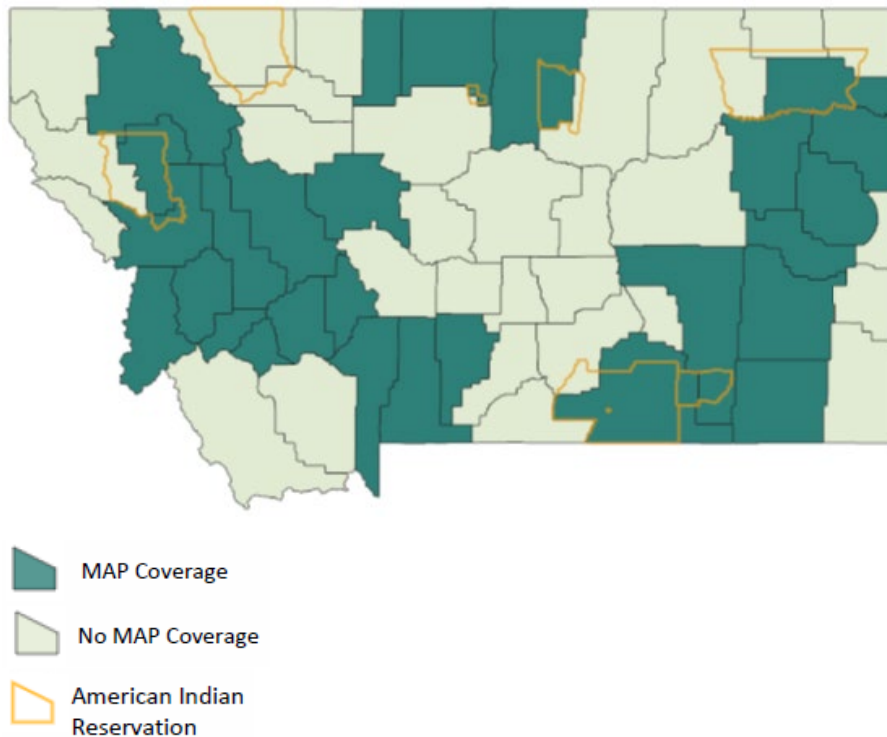
## Introduction

The Montana Asthma Home Visiting Program (MAP) is a program designed to give free asthma education for people of all ages with uncontrolled asthma. It was started in 2011 based on medical guidance and research from the Centers of Disease Control and Prevention.<sup>1</sup>

The program includes six visits over the course of one year. The initial visit involves taking baseline measurements and a home environmental assessment to discover potential asthma triggers. Subsequent visits include a continuation of asthma education, asthma control measurements being taken again, support connecting with health and social services, and removal of potential asthma triggers.

Currently, there are nine MAP sites: Anaconda-Deer Lodge County, Cascade County, Custer County, Flathead County, Gallatin County, Lewis & Clark County, Missoula County, Richland County, and Bullhook Community Health Center. Previously, there were sites in Park County and Silver Bow County, which have since left the program. One site can cover multiple counties in an area. The map below shows all counties which have been covered by the program:

**Figure 1. Montana Asthma Home Visiting Program Coverage, 2011 - 2021**



Bullhook Community Health Center in Hill County, Missoula City-County Health Department, and Lewis and Clark Public Health were the three pilot sites in the first year of the program. These three sites were active for the next three years. Starting in 2014, Cascade City-County Health Department; Flathead City-County Health Department; and Richland County Health Department were added as well. Custer County Health Department, Butte-Silver-Bow City-County Health Department, and Anaconda-Deer Lodge City-County Health Department were added in 2015, and Gallatin City-County Health Department and Park County Health Department were added in 2016. All sites were active until 2020 when Butte-Silver Bow

City-County Health Department left the program. Park County Health Department left the program two years later in 2022.

There are currently three ways to be eligible for MAP:

- Experiencing an asthma-related emergency department visit, hospitalization, or unscheduled medical office visit in the last year
- An Asthma Control Test (ACT) of less than 20 (uncontrolled) in the past year
- Direct referral from a healthcare provider

Starting in 2020, telemedicine was added as a visit option. While the third and fifth visit could always be conducted over the phone, video conferences for any visit were added for social distancing and safety reasons during the COVID-19 pandemic. This option was made permanently available for any site that would want to utilize it. In July of 2022, the program will expand statewide with virtual visits available to any participant who is outside of driving range to a site. The purpose of this report is to analyze and evaluate MAP metrics, participation, and results prior to the transition to statewide availability.

### Methods

MAP participant data was pulled from all sites from the start of the program (2011) through the end of 2021. Participants were considered to have completed the program if they attended all six of the visits. Sixty percent completion was defined as attending four out of the six possible visits.

Asthma control was determined using the Asthma Control Test. If a participant scored 19 or less, their asthma was considered “uncontrolled”. An Asthma Knowledge Quiz score of 10 or higher was considered “good” asthma knowledge. Demographic information was self-reported. Post-program metrics were only taken from those who completed all visits.

### Participation

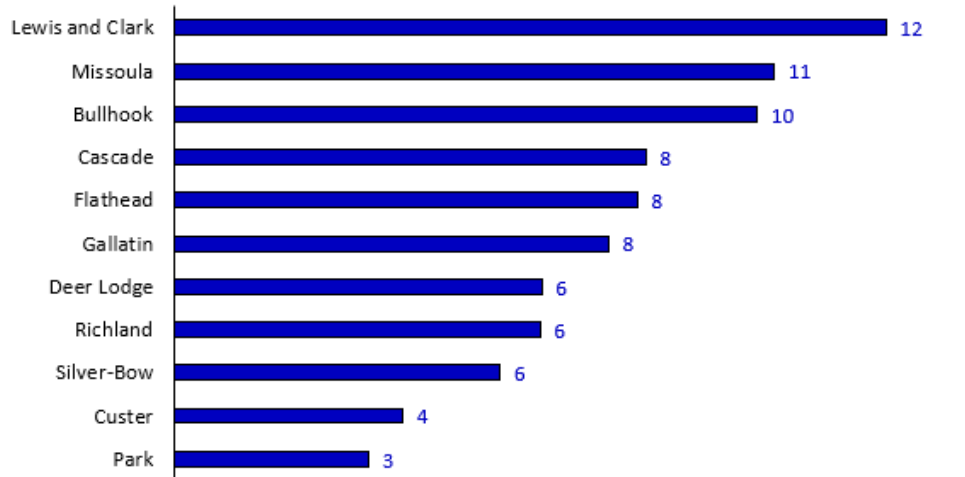
Figure 2. Number of MAP Enrollments by Year, Montana Asthma Home Visiting Program, 2011 - 2021



The enrollment numbers for the Montana Asthma Home Visiting Program have fluctuated over the years, starting with 73 participants in 2011. 2016 had the largest number of enrollments at 118, and

2012 and 2021 had the lowest number of participants at 29 each. On average, there were 67 participants per year (Figure 2).

Figure 3. Average Number of Participants per Active Year, by Site, Montana Asthma Home Visiting Program, 2011 - 2021



Lewis and Clark Public Health had the highest average number of clients, at 12 per year. Missoula City-County Health Department was very close behind at 10 per year. Custer County Health Department, and Park County Health Department had the lowest average, being four and three per year, respectively. All sites should have an average caseload of at least eight participants per year, which only Flathead City-County Health Department, Cascade City-County Health Department, Bullhook Community Health Center, Missoula City-County Health Department, and Lewis and Clark Public Health are currently meeting. Gallatin, Anaconda-Deer Lodge, Richland, and Custer County Health Departments are all currently below average caseload standard (Figure 3).

Table 1. Age Demographic Information of the Montana Asthma Home Visiting Program, 2011 - 2021

Age Category	Age Group					
		0-4	5-11	12-17	18-65	65+
All Ages	Pre-2018*	38%	46%	16%	-	-
	Post-2018	35%	28%	9%	28%	<1%
Children (0 – 17)	Pre-2018*	38%	46%	16%	-	-
	Post-2018	47%	40%	13%	-	-
Adults (18+)	Pre-2018*	-	-	-	-	-
	Post-2018	-	-	-	96%	4%

\*Adult (18+) clients were allowed in MAP starting in mid-2018

Table 2. Racial Demographic Information of the Montana Asthma Home Visiting Program, 2011 - 2021

	Race		
	White	American Indian/Alaskan Native	Other
All Ages	81%	7%	12%
Children (0 – 17)	78%	8%	13%
Adults (18+)	84%	2%	14%

**Table 3. Sex Demographic Information of the Montana Asthma Home Visiting Program, 2011 - 2021**

	Sex	
	Female	Male
All Ages	43%	57%
Children (0 – 17)	39%	61%
Adults (18+)	80%	20%

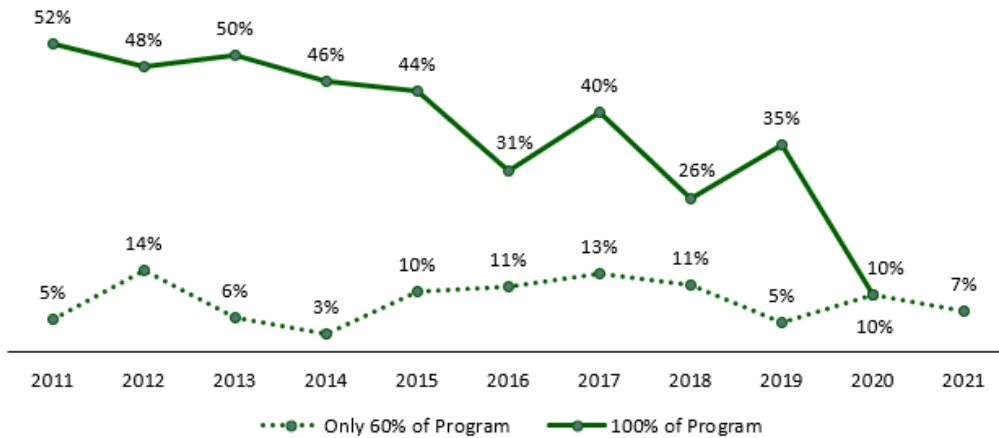
MAP was initially designed for children and started admitting adults in 2018. The age group of 5 – 11 years old was the largest prior to 2018, at nearly half of all participants (46%). After 2018, adults were 28% of all participants. Young children (age 0 – 4 years) made up 39% in 2011 – 2017 and 35% 2018 to 2021 (Table 1).

More than four-fifths of participants in MAP identified as white (81%). Seven percent identified as American Indian or Alaskan Native, and the remaining 12% were classified as neither of the previous two. This was similar across age groups, with 78% of the child participants being classified as white and 84% of adults (Table 2).

The majority (57%) of participants in MAP were male, and the remaining 43% were female. However, when this is looked at regarding the participants’ ages, most (80%) of the adult participants were female, while more than half (61%) of the child participants were male (Table 3).

**Retention and Referrals:**

Figure 4. Percent of MAP Clients Who Completed 60% and 100% of the Program, Montana Asthma Home Visiting Program, 2011 - 2021



From 2011 to 2015, around half of the participants completed all visits in the program. Between 2016 and 2019, the average was around a third. 2020 only had around 10% of participants complete and 2021 did not have any participants who completed the program, due to the visits being over the course of a year, so the data is not yet complete. Some possible explanations for the low completion percentage since 2020 could include lost to follow-up during the COVID-19 pandemic, participants withdrawing for

safety concerns, and local health departments having to instead switch resources to contract tracing and vaccination outreach (Figure 4).

Figure 5. Number of Referrals, by Type, Montana Asthma Home Visiting Program, 2011 - 2021

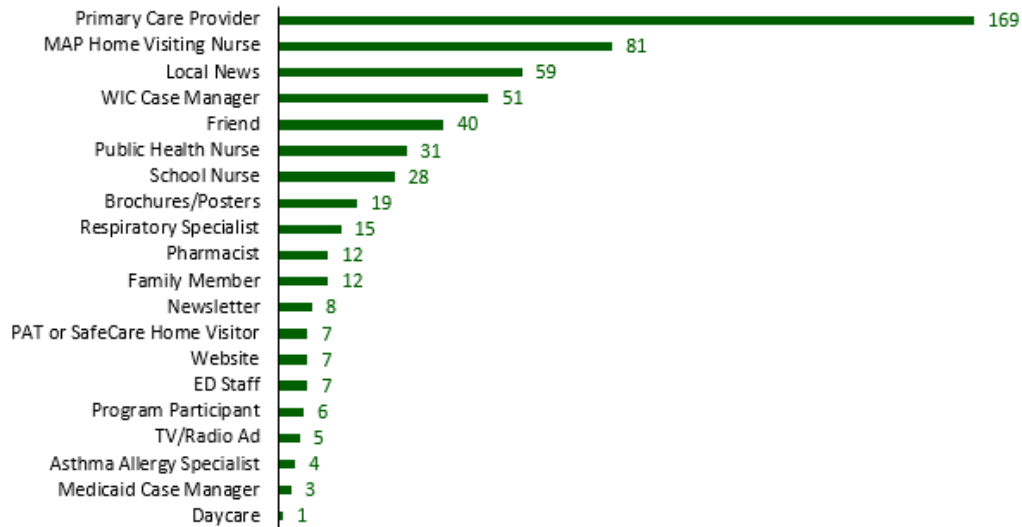
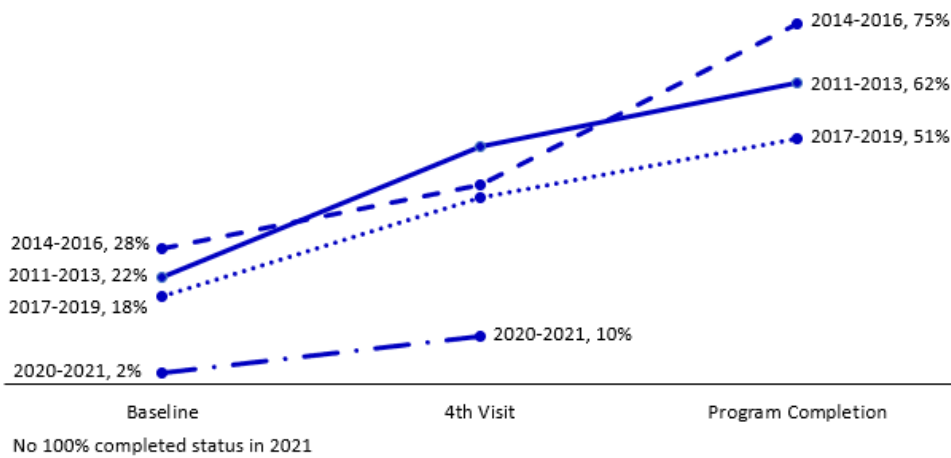


Figure 5 describes the number of referrals between 2011 and 2021 into MAP by their source. The top three sources of referrals to MAP came from primary care providers (169), MAP home visiting nurses (81), and local news (59). This suggests that the best source for information on the program for potential patients is through those who work with the program, such as outreach from providers or the home visiting nurses (44%). There are very few referrals from advertising outreach from the MACP directly, such as brochures, newsletters, and the website (6%). However, it isn't possible to determine if a participant saw the marketing material, but ultimately received their referral from a healthcare provider (Figure 5).

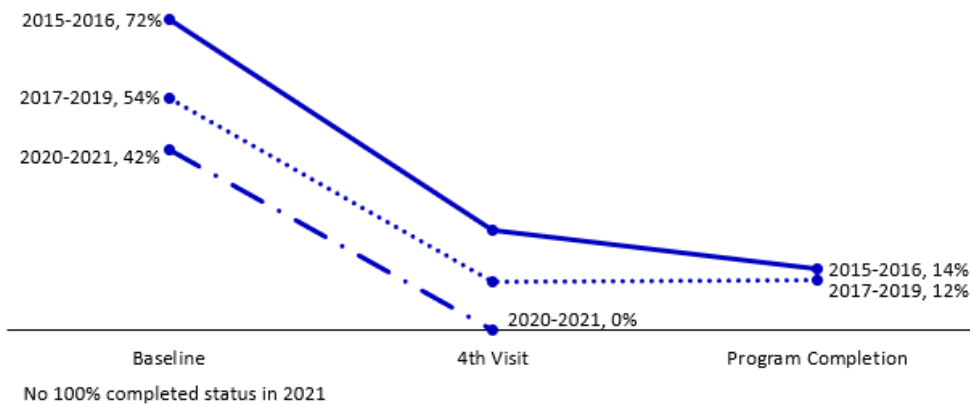
### Program Outcomes - Children

Figure 6. Child Asthma Control, by Completion Status and Year Group, Montana Asthma Home Visiting Program, 2011 - 2021



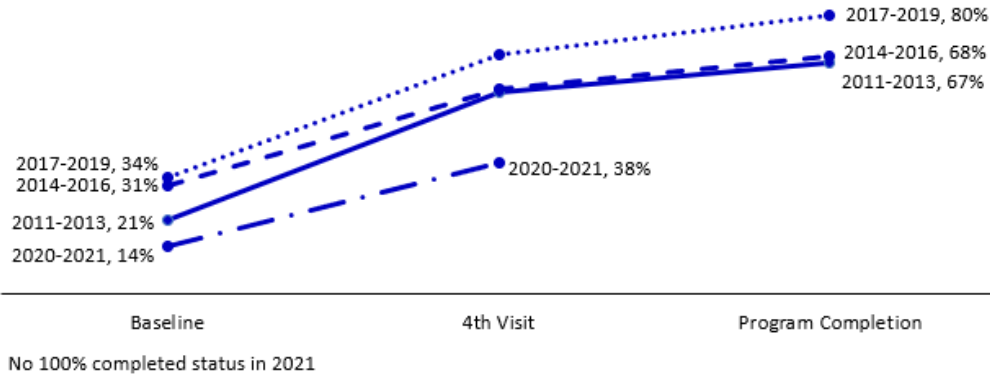
Asthma control is one of the best methods for increasing quality of life with asthma. The asthma control test is administered to all participants above the age of four at the first, fourth, and final visit. From 2011 to 2019, around a quarter of the child participants had their asthma controlled at baseline. In this same time span, more than 50% of participants had their asthma controlled after program completion (Figure 6).

Figure 7. Child MAP Participants Who Had at Least 1 ED or Hospital Visit in the Past 6 Months, by Completion Status and Year Group, Montana Asthma Home Visiting Program, 2015 - 2021



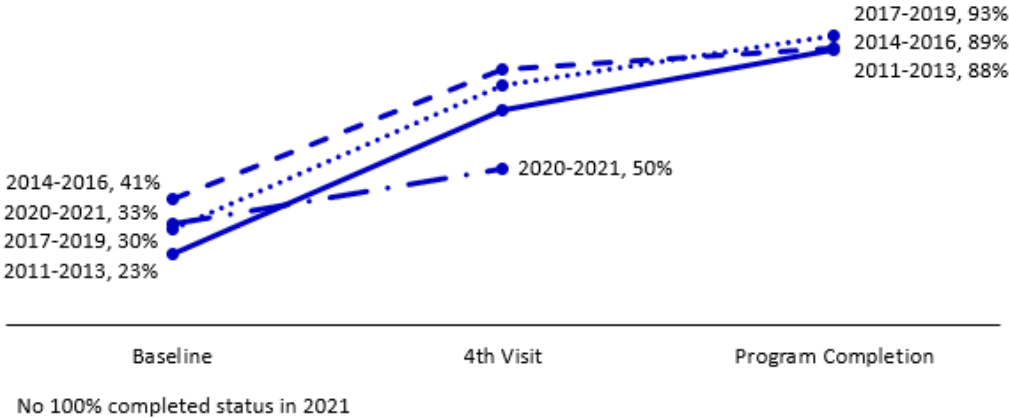
From 2015 – 2019, more than half of child participants had an ED or hospital visit upon program entry, which dropped to around 13% when the program was completed. In 2020 and 2021, 42% of participants started the program with a recent ED or hospital stay, but they didn't have an ED or hospital visit at 60% of the check-ins; however, the COVID-19 pandemic may have impacted ED visits or hospital stays (Figure 7).

Figure 8. Child Participants with Good Asthma Knowledge, by Completion Status and Year Group, Montana Asthma Home Visiting Program, 2011 - 2021



The asthma knowledge test is also given to participants multiple times throughout the program. Less than one-third of program child participants had a good baseline knowledge of asthma, which increased to more than two-thirds upon program completion (Figure 8).

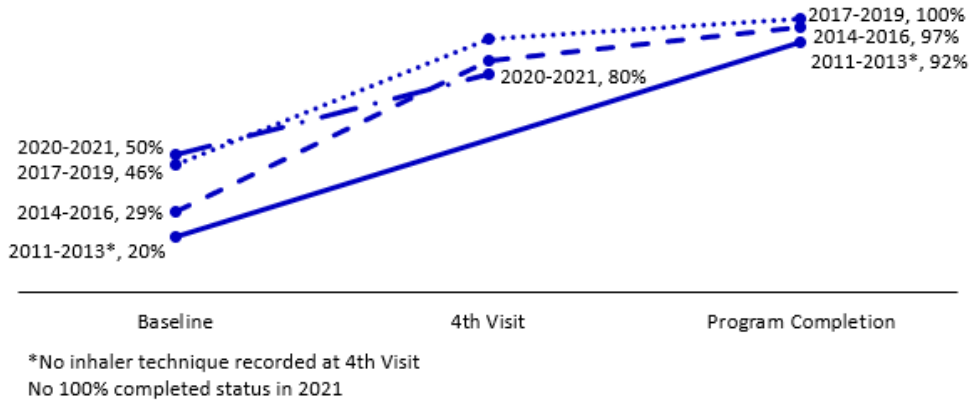
Figure 9. Child Participants which Have an Asthma Action Plan, by Completion Status and Year Group, Montana Asthma Home Visiting Program, 2011 - 2021



Despite asthma action plans being excellent tools for asthma control, less than 41% of child participants had one at the start of the home visiting program. This number increased to more than 88% upon program completion (Figure 9).



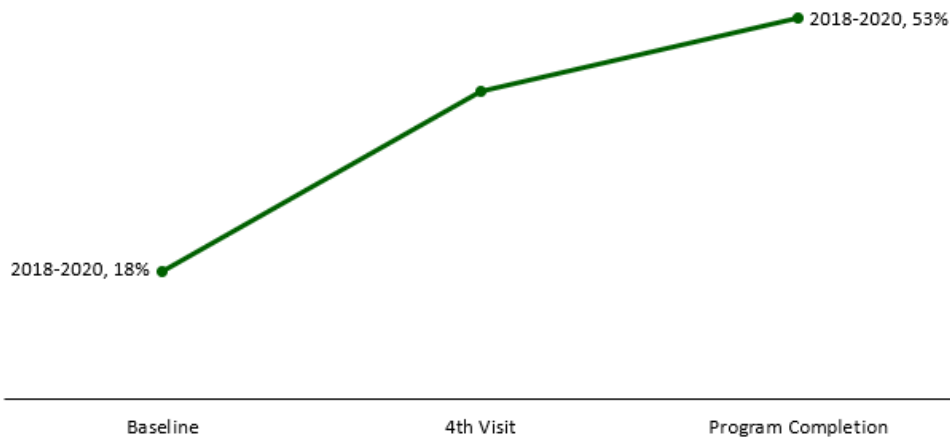
Figure 10. Child Participants with Good Inhaler Technique, by Completion Status and Year Group, Montana Asthma Home Visiting Program, 2011 - 2021



Inhaler technique involves the home visiting nurse demonstrating to the participants how to use their inhaler and ensure that the asthma medication is reaching the lungs. Less than 50% of child program participants had good technique at baseline. For participants who completed the program, this increased to over 90% (Figure 10).

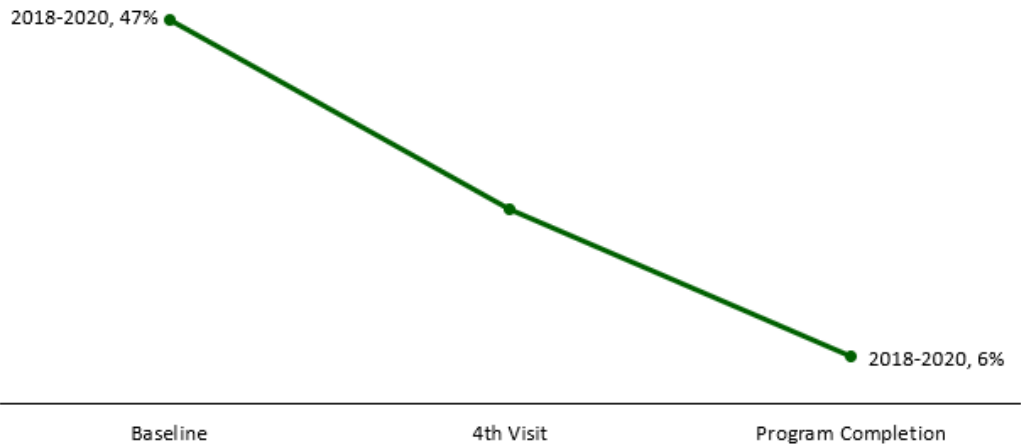
**Program Outcomes - Adults**

Figure 11. Adult Asthma Control, by Completion Status, Montana Asthma Home Visiting Program, 2018 - 2020



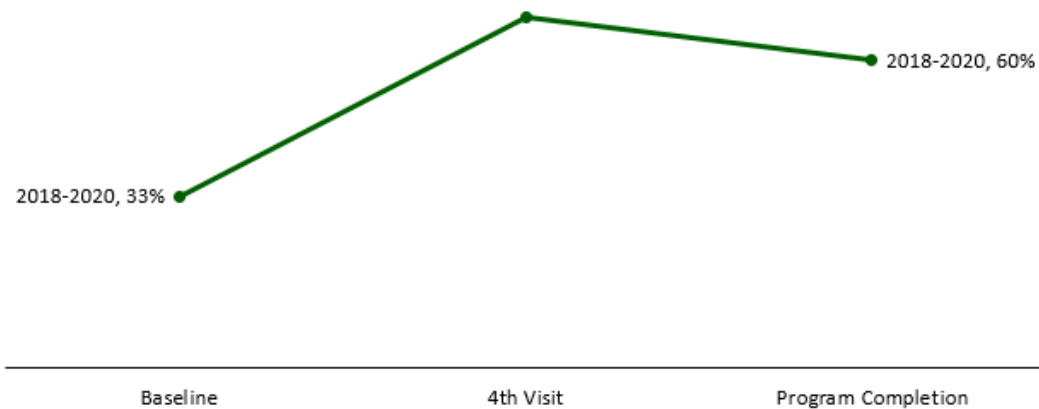
For the adults in the program from 2018 to 2020, less than one-fifth (18%) of program participants started the program with their asthma well-controlled. For the participants who completed the program, this increased to 53%. (Figure 11).

Figure 12. Adult MAP Participants Who Had at Least 1 ED or Hospital Visit in the Past 6 Months, by Completion Status, Montana Asthma Home Visiting Program, 2018 - 2020



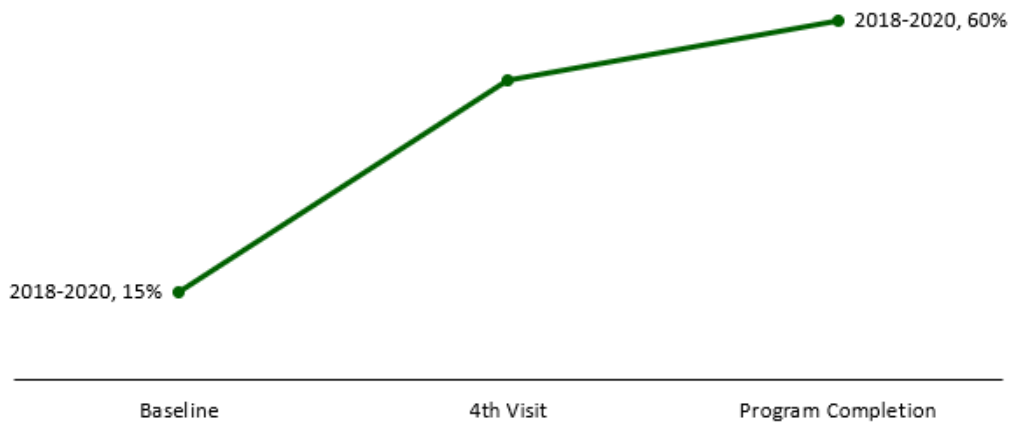
Much like the child participants, half of the adults entering MAP from 2018 - 2020 had a recent emergency department or hospital visit. This number dropped even further to 6% upon program completion (Figure 12).

Figure 13. Adult Participants with Good Asthma Knowledge, by Completion Status, Montana Asthma Home Visiting Program, 2018 - 2020



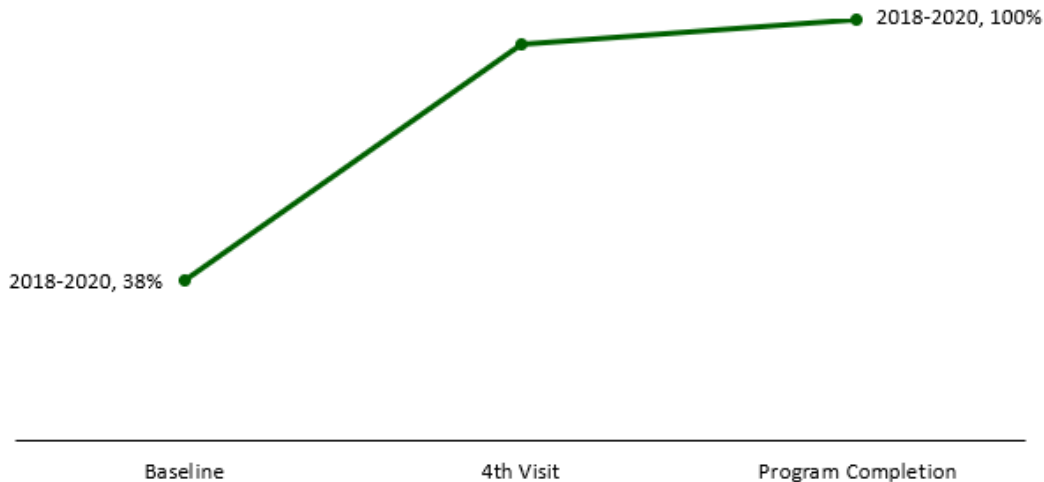
Only one-third of adult program participants had a good baseline knowledge of asthma, which increased to 60% upon program completion (Figure 13).

Figure 14. Adult which Have an Asthma Action Plan, by Completion Status, Montana Asthma Home Visiting Program, 2018 - 2020



Even less adults started MAP with asthma action plans than children, at 15% of participants. However, by the time of program completion, this number rose to 60% (Figure 14).

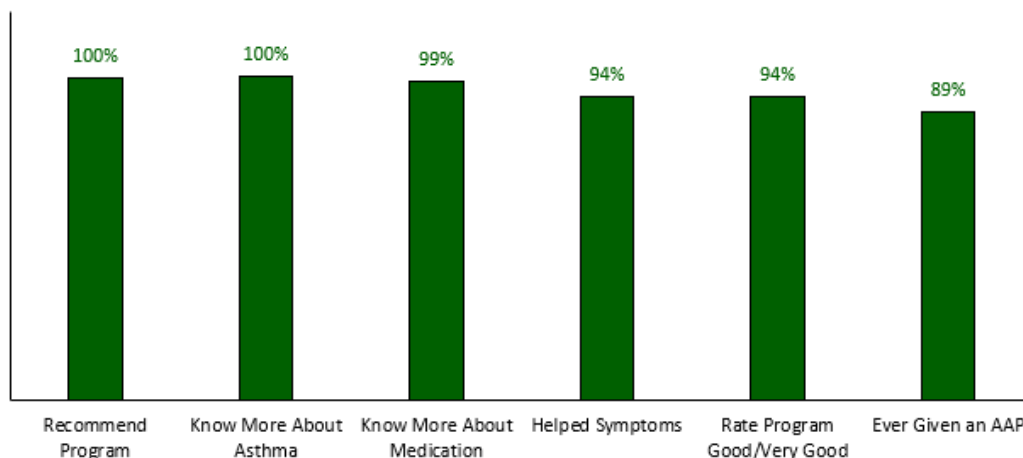
Figure 15. Adult Participants with Good Inhaler Technique, by Completion Status, Montana Asthma Home Visiting Program, 2018 - 2020



Only 38% of participants had good technique in the first visit. Unlike children, all adults who completed the program were able to effectively use their inhaler to receive the correct dosage of medication (Figure 15).

### Post-Program Metrics

Figure 16. Post-Program Metrics, Montana Asthma Home Visiting Program, 2011 - 2021



In the follow-up survey, nearly all participants stated that attending MAP helped them know more about their asthma and medication, and they would recommend the program to others. Over 90% of participants stated that it helped their asthma symptoms, and 89% said that they were given an asthma action plan. Nearly all (94%) participants rated the program as “Good” or “Very Good” (Figure 16). Overall, MAP is very well-regarded with those who completed the program.

### Discussion

In the 10 years that MAP has been active, the program has changed to better accommodate the needs of the participants. One of the biggest changes was midway through 2018 opening the program to allow adults. After this, over a quarter (~29%) of all participants were adults, showing a need for this type of home visiting program in the adult demographic.

The demographics of adult MAP participants do not necessarily reflect the demographics of Montana adults with asthma. According to BRFSS estimates, 90% of Montana adults with current asthma identify as white, 8% identify as American Indian/Alaskan Native, and about 1% identify as neither of those; in MAP, 84% of adult clients identify as white, 2% as American Indian/Alaskan Native, and 14% as another racial or ethnic composition. It is important to note, however, that race is self-identified in both, so this may result in differing identifications.

An alarming trend in MAP is the decrease in both enrollments and completion as time passes. While the attendance dip was understandable in 2020 and 2021 due to the COVID-19 pandemic causing health departments to turn most of their attention to the health crisis, this drop was by more than 50 participants per year. Furthermore, the percent of participants who complete the program has been 40% and under since 2016. Only five out of nine active sites are meeting the average eight participants per year. In all, participation should be higher and hopefully will increase with statewide virtual implementation.

In terms of program results, asthma knowledge, asthma action plans, and inhaler technique were mostly consistent from 2011 to 2021. Asthma control status and ED/hospital visits varied during each three-year group. For ED/hospital stays, the percentage of participants who had at least one visit in the past six months decreased every three-year group for all completion statuses. As for asthma control, despite having varying percentages in the three-year groups, all groups showed increased asthma control at both 60% of visits and when completing the program. Another note to highlight was that in both adult and child program outcomes, the results were consistently better if the participants stayed in the program for all six visits instead of only completing 60% of the program.

As for the differences between adult and children program results, the baseline metrics remained similar, aside from asthma action plans, which a lower percentage of adults than children had at their first visit (15% for adults vs 32% on average for children). Less adults also ended the program with an asthma action plan (60%) than children (average of 90%). On the other hand, a smaller percent of adults (6%) had an emergency department or hospital visit than children at the end of the program (13% on average).

The post-program survey had overwhelmingly positive results, with almost 90% in every single category. However, it is important to consider that the survey is given after program completion, so participants who were unhappy with the program may have simply stopped participating and did not qualify for the post-program survey.

## **Conclusion**

Even though the Montana Asthma Home Visiting Program has changed over the past decade, all the measurements taken with asthma outcomes still improved, achieving the purpose of MAP.

Enrollment continues to be the biggest hurdle to success. Not only did pure enrollment numbers drop by over 50%, but the percentage of participants who completed either 60% or 100% of the visits has also dropped. This was even shown in the average number of active participants per year for each site. Fifteen participants per year is considered the full caseload; no sites met that metric, and only five sites reached half of the quota, while one site is only meeting a quarter of the 15 visits. While the COVID-19 pandemic has been expected to negatively impact many health programs, enrollment is the highest potential area for growth. The expansion of service area to statewide may help increase enrollment.

The data in this report will guide statewide quality improvement projects to continue to refine and improve MAP to help increase asthma control across the state.

## References

1. THE MONTANA ASTHMA HOME VISITING PROGRAM (MAP).  
<https://dphhs.mt.gov/publichealth/asthma/asthmahomevisiting>. Accessed April 5, 2022.