

What is an ROI?

Return on Investment (ROI) is a ratio that compares the size of the gain or loss from an investment to its cost. It is commonly used as a measure of profitability of an investment and for comparisons of various investments.

The basic formula used to calculate an ROI is as follows:

$$ROI = \frac{\text{Total Gains} - \text{Cost}}{\text{Cost}} = \frac{\text{Net Gains}}{\text{Cost}}$$

A positive ROI indicates a profitable investment, while a negative one indicates a loss. The ROI is sometimes expressed as a percentage.

What are gains for an ADRC and how did we calculate them?

In the case of ADRCs gains are calculated by measuring savings generated by reduction in utilization of expensive healthcare services like 30-day readmissions and emergency department (ED) visits.

We used Medicare and Medicaid claims data to determine if a visit to an ADRC results in a reduction in utilization. We measured the utilization of ADRC visitors in a 12-month pre-period before the ADRC visit and a 12-month post period after (and including) their earliest ADRC visit in 2017. The change in utilization from the pre-period to the period post ADRC visit is compared to the change in utilization for a group of individuals with similar age, gender, chronic diseases, and frailty levels. The main difference is that the second group (also referred to as the control group) did not visit an ADRC in 2017.

One thing of note here is that all savings in utilization are estimated over a 12-month period. Hence, if we are calculating the ROI for a 3-month period, for example, the estimate for dollars saved would reflect the savings recouped over the following 12 months after visiting the ADRC, not just within the 3-month period.

What are our assumptions?

We assume that everything else being equal and by matching on major confounding variables like key demographics, chronic conditions, and frailty - the ADRC group would show a similar pattern as the group that did not visit the ADRC. The difference in the change of utilization then can be attributed to the ADRC visit. We assume the rates of readmissions and ED visits saved per customer from 2017-2018 have not changed over the years. We also assume that the rates of readmissions and ED visits saved per customer on original Medicare are similar for ADRC customers with other types of health insurance coverage or are uninsured.

Where did we get our dollar values?

In 2019 the Agency for Healthcare Research and Quality released [a report](#) estimating that the average hospital readmission within 30 days of a previous stay costed \$14,400. An [updated report in 2023](#) put the estimate at \$17,549.

In 2020 the Agency for Healthcare Research and Quality released [a report](#) estimating that the average emergency department (ED) visit costed \$530. An [updated report in 2023](#) put the estimate at \$757. These numbers were the latest figures available from a reliable source and were adopted for the ROI calculation. Updated estimates will be incorporated into the ROI calculator as they become available.

What does it mean?

A positive ROI means that any investment into your ADRC generates savings greater than the cost to run the ADRC. The higher the ROI, the more the savings generated and the better the case to increase investment in the ADRC/NWD program.

An ROI of 3 (or 300%) indicates that savings from the ADRC program are 3 times the cost of running the ADRC, another way to interpret this – for every dollar invested in the ADRC program, it generates 3 dollars in savings for the healthcare system because of reduced utilization (either lower readmissions or ED visits post visit) among ADRC customers.

Why do I see a negative ROI?

We may see negative ROI for shorter periods because of the following:

- 1) The ROI is dependent on the number of customers, while the costs seem like they are more or less independent. So, as the number of customers rises, the savings rise rapidly - while costs don't rise as quickly.
- 2) It also indicates there may be a minimum number of ADRC customers for there to have a positive ROI. In essence, ADRCs require a critical number of customers beyond which we begin to see a return or “profit”.

The study measured the change in readmissions and ED visits over a 12-month period. Therefore, we recommend using a 12-month duration for ROI estimation.