Economies of Scale in the Cost Structure of Telemedicine Delivery
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Introduction
\begin{itemize}
\item The relationship between program size and per patient costs is important to mergers and acquisitions, regulation and production capacity decisions.
\item There is widespread speculation that economies of scale exist in most telemedicine delivery models.
\item To date economies of scale have been evaluated using only singular programs and time periods.
\item An evaluation should include data from multiple programs and time periods.
\end{itemize}

Methods
\begin{itemize}
\item Systematic evaluation of hundreds of pertinent studies in the telemedicine literature
\item All cost studies (67) that contained sufficient data for a comprehensive analysis were set aside for further use
\item Modeling of cost structure of telemedicine delivery by estimating the effect of program size, time, and other factors on average total costs with multivariate regression.
\item The model estimated was of the following form:
\begin{equation}
\text{LOGCOST} = \beta_0 + \beta_{\text{SIZE}} + \beta_{\text{TIME}},
\end{equation}
\begin{equation}
\beta_{\text{DEVELOPING}} + \beta_{\text{ESTABLISHED}} + \beta_{\text{NO MD}} + \beta_{\text{ASYNCHRONOUS}},
\end{equation}
\begin{equation}
+ \nu.
\end{equation}
\end{itemize}

Data
\begin{itemize}
\item Costs are generally decreasing as program size increases.
\item Costs have generally risen since 1995, though the effect may have tapered in recent years.
\item Already-running programs, programs that do not require a doctor, programs in developing countries, and countries that do not use synchronized telecommunications technology all tend to experience lower costs than their counterparts.
\item However, the results of this study are highly weakened by its small sample size.
\end{itemize}

Results: Size and Time
\begin{itemize}
\item Costs generally decreasing as program size increases.
\item Costs have generally risen since 1995, though the effect may have tapered in recent years.
\item Already-running programs, programs that do not require a doctor, programs in developing countries, and countries that do not use synchronized telecommunications technology all tend to experience lower costs than their counterparts.
\item However, the results of this study are highly weakened by its small sample size.
\end{itemize}

Summary of Regression Results
\begin{itemize}
\item Factor
\item Effect
\item Size
\item For modest-sized programs, increasing size leads to reduced costs.
\item Year
\item Costs increased between 1995 and 2002.
\item Established
\item Programs that have been running longer see lower costs.
\item No MD
\item Programs that do not require a doctor see lower costs.
\item Asynchronous
\item Programs using asynchronous technology see lower costs.
\item Developing
\item Programs in developing countries see lower costs.
\end{itemize}

Conclusions
\begin{itemize}
\item Evidence for economies of scale in telemedicine delivery:
\item larger programs tend to see lower average costs.
\item further expansion of telemedicine’s role in healthcare could allow providers to extend care to underserved populations.
\item Data-related limitations.
\end{itemize}

References

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