STATE OF MAINE
DIRIGO HEALTH AGENCY

RE:	DETERMINATION OF AGGREGATE MEASURABLE COST SAVINGS FOR THE FOURTH ASSESSMENT YEAR (2009)	PRE-FILED TESTIMONY OF KENNETH THORPE

Q: Please state your name, company, and primary business location.

A: Dr. Kenneth Thorpe, Department of Health Policy & Management Rollins School of Public Health, Emory University, 1518 Clifton Road, NE, Atlanta, Georgia, 30322.

Q: What is your position at Emory University?

A: I am the Robert W. Woodruff Professor and Chair of the Department of Health Policy and Management at the Robbins School of Public Health. I have held that position since 1999.

Q: Dr. Thorpe, briefly tell us about your experience performing statistical modeling analyses.

A: I have undertaken and published a wide range of statistical/empirical research over the past 30 years. My curriculum vitae (CV) is DHA Exhibit 14 – Thorpe CV.

Q: Please describe generally the work you and your staff did on behalf of the Dirigo Health Agency (DHA).

A: We consulted with the DHA and **s**chramm▫**r**aleigh **H**ealth **S**trategy (**srHS)** team on the development of the methodology for estimating the savings associated with two calculations – the cost per case-mix adjusted discharge (CMAD) and bad debt and charity care (BD/CC). We worked together to produce the final savings amounts in the Year 4 AMCS Report for these two calculations.

Q: Can you describe why the multi-state, multivariate approach was used for the CMAD calculation in the Year 4 AMCS?

A: It is standard methodology to use a multi-state, multivariate approach, especially when the time period since intervention (i.e., Dirigo enactment) increases, making the pre-intervention time period trend less appropriate to use. Multivariate analysis is ideal when one wants to account for other factors besides the introduction of Dirigo that could influence the CMAD.

Q: Can you explain these multi-state, multivariate analyses using layperson's terminology?

A: Multi-state, multivariate analyses use other states' concurrent experience to develop a benchmark for what would have happened in the intervention state, after adjusting for multiple factors (i.e., variables) to customize the benchmark to the intervention state. In other words, in the CMAD

calculation we estimate what Maine's trends would have been in the absence of Dirigo. Other factors that could have affected CMAD savings are accounted for in the regression modeling. In the end, the regression models, after adjusting for multiple variables, allowed us to identify the impact of Dirigo.

Q: Dr. Thorpe, are there typical regression variables used for this type of hospital expenditure trending analysis?

A: Yes, there are common variables to include, such as teaching intensity, case mix, wage index, number of hospital beds, urban/rural location, mix between types of payors, and demographic information related to the poverty level and level of uninsurance in the State. When working with **srHS** to develop to the initial regression variables, these are the variables I recommended they use.

Q: Are these the variables used for the CMAD regression analysis?

A: Yes.

Q: Dr. Thorpe, Mr. Schramm testified that you helped developed the clustering variables for the CMAD calculation. Is that accurate?

A: I did. They were based on the key factors that influence hospital costs such as case mix, size of the hospital, whether it is a critical access hospital or a teaching hospital, the location of the hospital, payor mix,

cost-to-charge ratios, hospital margins and expenses per day and several demographic variables including state population, state household income, low-income population, and uninsurance rate.

Q: Dr. Thorpe, you just testified that you were involved in the original clustering discussion. Why did you then recommend a national approach based on US hospital data for the CMAD calculation?

A: Both approaches have their strengths and weaknesses. Our clusters control along an array of variables similar to those used in the regression to fit to the model, so the model will have greater explanatory power associated with the independent variables. A national analysis has more variance since hospitals in different parts of the country face different market forces and regulatory environments that could influence costs. The national analysis will have greater predictive power as it has substantially more observations.

Q: Dr. Thorpe, there has been a lot of discussion about the predictive power versus the explanatory power of regression modeling. Can you explain to us the statistical output from these two models used in the CMAD calculation in terms of predictive power and explanatory power?

A: None of the variables should be looked at in isolation. The key variables we typically look at for explanatory power are the t-statistics as they relate to the impact of Dirigo on the CMAD. For predictive power overall, we

typically look at the R-squared values (the percent of underlying variation in the data that is accounted for by the model). For these models, the R-squared values are high, 43 percent for the United States (US) hospital model, and very high for the cluster of comparison states, 98 percent for Cluster 1, indicating that the variables included in the regression account for virtually all the underlying variation in costs across hospitals over time.

Q: Is it typical to provide weighting to arrive at a final savings figure?

A: There is no single way to conduct a regression analysis. This was a conservative approach to blend savings conclusions arrived at by using different comparison groups.

Q: Dr. Thorpe, is the methodology employed for the SFY07 CMAD calculation reasonable?

A: Yes. It is.

Q: And does it arrive at a reasonable estimate for SFY07 CMAD savings attributable to Dirigo?

A: Yes. It does.

Q: But are the results statistically significant?

A: Not at traditional significance levels used in most of the social sciences—they generally use a p-value of .05—that is, there is a 95 percent chance

that the estimate is different from zero in this case. But the attribution to Dirigo is statistically significant for one of the models at just above the .05 level (.055). And we are not conducting a randomized trial where results are tightly controlled – this is a real-world analysis where results can and do vary. As a result, we need to look at what the analyses are telling us as a whole, not just focus on one statistic. From past proceedings, we already have proof that there have been savings attributed to Dirigo. We were asked to develop a model that determined what the benchmark trend in CMAD would be in the absence of Dirigo using a suitable set of comparison states. We began to gather data to build that model and our preliminary tabulations of that data showed Maine having cost growth trends lower than that of the US and the Northeast. We took two approaches to the actual regression modeling, developing one model based on all US hospital (US-Hospital Level) data and one model based on a cluster of comparable states (Cluster 1-State Level).

The US hospital model is not based on a sample. It uses the complete universe of hospital experience in the US during the time periods in question (approximately 40,000 observations) and so will have excellent predictive power for CMAD trend in the absence of Dirigo. The model based on the cluster of comparable states specifically identifies those states that are similar to Maine in the pre-Dirigo time period along the

array of regression variables and so will have strong explanatory power to tell us whether or not the change in CMAD is attributable to Dirigo.

The savings estimate associated with the US hospital data model is $119.4 million in savings and there is a 45 percent chance that the savings are directly due to Dirigo. The savings estimate associated with the cluster of comparable states is $233.4 million and there is a 95 percent chance that the savings are directly due to Dirigo.

The evidence tells us that Maine's CMAD growth has been reduced. The US hospital model is inconclusive as to whether that reduction can be attributed to Dirigo. On the other hand, the model based on comparable states (Cluster 1), with a p-value of .055, is statistically significant at just above the .05 level. Looking at the weight of the evidence, Dirigo is the most likely cause of the reductions in CMAD.

Q: Turning now to the second initiative, can you describe why the multi-state, multivariate approach was used for the BD/CC calculation in the Year 4 AMCS?

A: We wanted to use a dataset that would allow us to estimate how many children and adults in Maine would have been uninsured in the absence of Dirigo. So we used the multivariate approach to generate this

"counterfactual" estimate.

Q: Dr. Thorpe, can you explain what DHA Exhibits 15 through 18 are?

A: These exhibits are reproductions of a figure and three tables in Appendix I of the **srHS** report. DHA Exhibit 15 – Trends in Uninsurance Rate is a graphical representation of how uninsurance rates have changed over time in the US, Northeast, and Maine. You'll notice the big difference in the uninsurance rates between Maine and the US and Northeast, especially in 2006. DHA Exhibit 16 – Uninsurance Rate and Uninsurance Rate Simulations, DHA Exhibit 17 – Estimates of Uncompensated Care in Maine, and DHA Exhibit 18 – BD/CC Savings, show the results of the uninsurance rate, uncompensated care, and savings calculations, respectively.

Q: How does DHA Exhibit 15 lead us to the savings figures in DHA Exhibit 18?

A: DHA Exhibit 15 shows the actual uninsurance rates over time for the US, the Northeast, and Maine. DHA Exhibit 16 shows the results of the eight analyses (using the information in DHA Exhibit 15) to predict the uninsurance rate in Maine for 2008. We then compare these predicted rates to the actual rate to determine the savings in DHA Exhibit 18.

In DHA Exhibit 16, Columns III-VI are calculated by using the adjusted historical control method, and Column VII using the historical control method. They essentially trend the pre-Dirigo Maine uninsurance rate to 2008 using observed trends in uninsurance rates in the US and Northeast during the post-Dirigo time period, and in Maine in the pre-Dirigo time period.

Columns VIII-X estimate the 2008 Maine uninsurance rate in the absence of Dirigo using a logit regression that controls for gender, age, race, marital status, family size, geographic location, working status, income, Medicaid eligibility, and State Children's Health Insurance Program eligibility.

The above estimates of the 2008 Maine uninsurance rate in the absence of Dirigo then translate into the savings figures by using the estimate uncompensated care for the uninsured as laid out in DHA Exhibit 17 and the actual uninsurance rate in Maine in 2008 in the presence of Dirigo.

Q: How did you arrive at one savings number given the various calculations?

A: We felt most comfortable relying on the results of the regression analyses, putting 75 percent weight on the US results and 25 percent weight on the Northeast results. This represents a conservative blend of the range of savings estimates obtained. The national data was more heavily weighted

as the NE states have been more active in health care reform activities (VT, MA, NY) compared to other states, so we thought a mix of both national and regional control group was sensible.

Q: Dr. Thorpe, why did you assume a 1/1/03 start date for Dirigo?

A: Dirigo was enacted in May 2003 and the data was available on a calendar year basis, so we used 1/1/03 to capture all of the impact that took place during 2003.

Q: Dr Thorpe, is this a reasonable methodology to use for Year 4 BD/CC savings attributable to Dirigo?

A: Yes. It is.

Q: How does this methodology compare to the calculations you performed for the Year 1 AMCS hearing?

A: It is very similar to the calculations I performed for the Year 1 AMCS hearing, and expands upon it by looking at the total Maine population and not just those enrolled in DirigoChoice or Medicaid Expansion to working parents.

Q: Dr Thorpe, do you adopt as part of your testimony the Exhibits you discussed, DHA Exhibits 14 through 18?

A: Yes. I do.