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Local Health Departments (LHDs) revenues come from various sources, including: local, state and federal governments, private grants, donations and fees for services.

In times of economic instability, the ability to forecast future revenues can help LHDs to plan ahead.

Forecast models reported in this study suggested declining revenue for most Wisconsin LHDs between 2012 and 2014.

Using a forecasting model to predict revenue trends can help LHDs to plan, develop strategies and identify new funding sources to sustain essential services.

Predicting Wisconsin Local Health Departments Revenues

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Local Health Departments (LHDs) are responsible for delivering vital public health services to the population. The funds that make these services possible primarily come from local, state, and federal government sources. During economic downturns, tax revenues to all levels of government decline, reducing the flow of funding for public health services and practices.

What can LHDs do to plan ahead when economic conditions pose a threat to local services? Susan Zahner, public health researcher, and Andrew Reschovsky, economist, from the University of Wisconsin - Madison, combined their expertise to study whether revenue forecasting methods used in the field of economics could be applied to local public health.

Using revenue and expenditure data from the Wisconsin Department of Health Services - Local Health Department Surveys (2002-2009), Reschovsky and Zahner created a "forecasting strategy" for each revenue source for all 92 LHDs in Wisconsin. A mathematical model was created to predict revenues for each source and applied to create annual estimates for the period from 2012 to 2014. The total revenue was predicted to be $170.5 million for 2012 and $162.5 for 2014, representing a decrease of 4.7%, after accounting for inflation. On a per capita basis, LHDs revenues were forecasted to decline by 6.6% between 2012 and 2014.

The Great Recession adversely impacted the finances of LHDs, which depend on a reliable flow of revenue. The results of this study reveal the LHDs' need to find new sources of funds to avoid more cuts in public health service delivery.

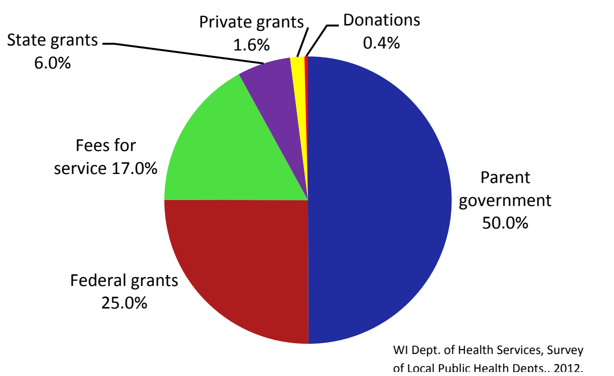
From: Reschovsky, A. & Zahner, S. (25 March 2013). Forecasting the Revenues of Local Public Health Departments in the Shadows of the "Great Recession". *J Public Health Management Practice, 19*(1), 1-9. doi: 10.1097/PHH.0b013e31828ebf8c.

Recession and LHDs

The Great Recession resulted in state government deficits that totaled more than $500 billion. Although state tax revenues have been growing in recent years, the rate of growth has been slower than in most post-World War II economic recoveries. Since the beginning of the Great Recession, budget gaps have been closed primarily by cutting state spending, including reductions in state funding of local public health services.

Property taxes constitute the most important source of revenue for local governments. Calculations using US Census Bureau data indicate that inflation-adjusted property tax revenues have declined by 8.4 percent between their peak in the fourth quarter of 2009 and the second quarter of 2013. Research has shown that changes in property tax revenues lag changes in housing prices by about three years. Thus, despite the recovery of housing prices in most places, property taxes revenues may stagnate for the next few years. In addition, the fiscal outlook for federally funded public health programs is bleak as the federal government works on reducing the national debt.

The analysis of all revenue sources for Wisconsin's LHDs revealed reductions in funding from local, state, and federal sources. The fiscal effects of the Great Recession are likely to linger for years to come, challenging LHDs' ability to meet their responsibilities.

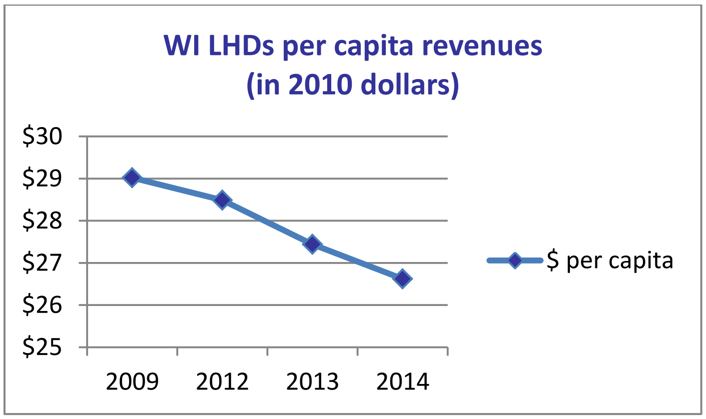


Forecasting strategies used in the study

Table 1: Forecasting strategies by sources of revenue	
Parent government	**Property tax** – State imposed limits on increases in property tax levies are related to rates of new construction. A statistical model is used to predict rates of new construction in each parent government.
	Sales tax – Data from 11 years of county sales tax revenues were used to forecast future sales revenues as a function of per capita real estate sales taxes revenues plus county fixed effects.
	Shared revenues – From 2011 to 2013, counties and municipalities experienced a reduction of up to 25% in unrestricted "Shared Revenue" grants from state government. The base assumption was that Shared Revenue allocations would remain unchanged in nominal terms.
Federal grants	From "need-based" or competitive grant programs. Historically, grants varied from year to year, with the tendency to keep increasing. Forecasts from 2009 to 2012 are based on historical trends. Forecasts from 2012 to 2014 reflect reductions in discretionary domestic spending mandated by the Budget Control Act of 2011 and sequestration.
Fees for service	Vary over time and among the LHDs and depend on the size of the population, cost of services and LHDs policies. To forecast this source, the model calculates the average rate of population growth, assuming the revenues will increase over time.
State grants, private grants, and donations	Difficult to forecast because of large year-to-year fluctuation. The model used weighted average over a period of years, adding inflation rates.

Revenue forecasting results

The model used revenue data from WI LHDs for the 2002-2009 period to forecast the total revenue available for the years 2012-2014, in terms of 2010 dollars, always adjusting for factors such as inflation and population growth. The graph below displays actual per capita real (in 2010 dollars) LHDs revenues for 2009, and forecasted values for 2012, 2013 and 2014. The results show a reduction of available resources over this five-year period.



The results of the forecasting are sensitive to policy assumptions that were made. Table 2 shows the impact on LHDs revenues from seven alternative policy assumptions.

The first two policies would require state legislative changes. Either policy change would increase total LHD revenues by less than one percent (0.39% and 0.61% respectivily).

The third alternative policy would require independent actions from all parent jurisdictions for all LHDs. If this were to happen, revenues would go up for LHDs though, they would still be lower than in 2012.

The fourth and fifth options show the impact on LHD revenues of alternative assumptions about the magnitude of cuts in federal support of LHDs.

The last two policy alternatives involve changes in the behavior of individual LHDs. Increasing the fees collected for services provided (#6) by 15% would result in 2.66% more revenue overall. Increasing revenues from grants and other fund-raising activities would have a more modest impact on revenues. Neither of these policies would be easy to implement, but if successful they would generate financial resources to help offset revenue losses from other sources.

Table 2: Sensitivity of model forecasts to alternative policies – LHDs/ WI 2014 revenues, using 2010 dollars

Alternate policy assumptions (done one at a time assuming others stayed the same)	Change in % of total revenue
1. **Raise property tax levy limit from 0% to 2%**	**0.39**
2. **Increase shared revenue appropriations by 10%**	**0.61**
3. **Increase LHD share of parent government revenue by 5% over base case**	**2.38**
4. **Reduce base case % cut in federal aid by half**	**1.35**
5. **Double base case % cut in federal aid**	**-2.70**
6. **Increase revenue from service fees by 15%**	**2.66**
7. **Increase state revenue, donations and private grants by 10%**	**0.72**

Resources are decreasing, planning is key

Reductions in real per capita revenue across Wisconsin's LHDs varied between 1.5% and 13% over the five years from 2009 to 2013. These differences are attributable to different fiscal environments faced by parent governments across the state, and different mixes of revenue sources.

The forecasting model used to predict WI LHDs revenues is a useful tool for public health administrators and governments when planning for the future of public health services.

In economically challenging times, it is important that LHDs are able to forecast their revenues in order to plan for alternative revenue sources or, if need be, for services cuts.

The forecasts of reductions in revenues should encourage LHDs to look for new grant sources and new ways to collect fees. LHDs are encouraged to utilize multi-year revenue forecasting and planning strategies to minimize negative effects of revenue reductions on the quality of their services.

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