

An Examination of the Economic Feasibility of Alternate Models for Delivery of Prenatal Services in Rural West Virginia

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Introduction

In order to estimate the feasibility of rural prenatal delivery options, models have been constructed to indicate which options have the greatest likelihood of becoming self supporting. In order to build these models certain assumptions have been used. The validity of the model is dependent on the validity of the assumptions. Models make use of “what if.” If an assumption is changed, the end result will be altered.

One of the strengths of modeling is that the assumptions can be changed to show what the impact would be under different conditions. If someone viewing the model feels one or more of the assumptions should be modified, the model can accommodate those modifications and predict different outcomes. For the models presented in this report the assumptions are clearly stated and the models can be rerun, using different assumptions.

The assumptions are based on the data furnished to us by those in the field including the West Virginia Department of Health and Human Services. Additional data was provided through prenatal practices in the State. This data was augmented by information from federal sources.

In order to model the potential success of a rural practice in West Virginia two predictions must be made.

- The potential demand for the service
- The costs of supplying the service

Both of these are determined in the models which follow.

Determination of Potential Market

It is more difficult to estimate the demand for rural prenatal services than it is to forecast costs. Two groups of paired counties have been used to make estimations. The counties are Mineral and Hampshire in the Northeastern section of the State and Pocahontas and Webster in the East-central section. Both paired counties have no prenatal facilities, either hospitals providing care or rural clinics within 30 minutes drive. See map in Appendix A.

The counties differ in size, population and population density with those in the northeast having larger populations, smaller land area and higher population densities. Even though both pairs have no prenatal facilities within their boundaries, they present entirely different potential demand scenarios.

**Table 1
County Population**

County	Land Area (Sq. Miles)	2006 Population	Population Density (Population per Square Mile)
Hampshire	641.7	22,480	35
Mineral	327.7	26,928	82
Hampshire-Mineral	969.5	49,408	51
Pocahontas	940.3	8,755	9
Webster	556.0	9,696	17
Pocahontas-Webster	1,496.3	18,451	12
West Virginia	24,077.7	1,818,470	76

Source: US Census Bureau, Population Estimates Series

In order to determine potential demand, the first step was to determine over the past five years the number of women in the childbearing years.

**Table 2
Female Population Age 15-44**

Year	Hampshire	Mineral	Pocahontas	Webster
2002	4,041	5,221	1,563	1,865
2003	4,109	5,133	1,556	1,865
2004	4,134	5,038	1,552	1,871
2005	4,262	4,950	1,517	1,857
2006	4,419	5,120	1,476	1,874

Source: US Census Bureau, Population Estimates Series

The fertility rates for each county in the paired groups were then determined.

**Table 3
Fertility Rates for the Female Population Age 15-44**

	15-17 Years	18-19 Years	20-24 Years	25-29 Years	30-34 Years	35-39 Years	40-44 Years	Total 15-44 Years
Hampshire	25.1	112.6	164.9	104	52.5	21.8	4.6	58.4
Mineral	12.8	62	133.8	113.7	60.6	21.6	4.4	55.2
Pocahontas	15.7	90.7	130.8	107.7	52.2	20.2	2.9	52.5
Webster	5.7	70.4	148.3	92.6	36.9	19.6	0.5	48.9

* measured in births per 1000 women

Source: WV Department of Health and Human Resources; *Vital Statistics 2005*

Using this data, the number of births for the past five years was provided and averaged. The result was the potential number of women who might avail themselves of the prenatal service if it was available. For the two northeast counties, the market potential was 520 and for the east-central counties 185 per year.

Table 4
Average Number of Births by Age Group in Selected WV Counties

	15-19 Years	20-24 Years	25-29 Years	30-34 Years	35-39 Years	40-44 Years	Total 15-44 Years
Region I							
Mineral	32	80	83	53	20	5	273
Hampshire	36	91	63	36	17	4	247
Total							520
Region II							
Pocahontas	9	28	26	13	6	1	83
Webster	9	47	28	11	7	0	102
Total							185

Not all this potential will be realized. To estimate effective demand (the number of potential users who will become actual clients) the following was assumed. Many women will not use the facility as they already have an established source for prenatal services and will continue to use that source no matter what the inconvenience of travel may be. This effect may be strongest for the north central counties where hospitals with birthing and prenatal services are within 60-75 mile radius of the county centers.

That is not the situation in the south central pair of counties where the availability of alternate services is less accessible. The effective demand for the rural prenatal clinics in Region 2 may be a higher percentage of the potential demand for that reason. Still there will be leakage from the region. In both regions there may continue to be some women who will not seek prenatal care for a variety of reasons. In some cases, prenatal care practices among many pregnant women have already been established. This will create some original resistance to the use of a new provider.

In addition, there are women who will be sent to other providers due to the risks associated with their specific pregnancies. While it is not possible to precisely establish what the number will be, the reduced potential for return visits to the site after the initial encounter must be included in the model. The model does not include any interactions between the clinic and the provider to whom the referral is made.

For these reasons, this analysis assumes that, during the first year, 25 percent of the potential market will use the facility, and during the second year, as the facility becomes better known, 50 percent of the potential demand will make use of the facility for prenatal care. In the third and

following years, the model assumes a utilization rate of 65 percent of potential demand will become effective demand.

The number of visits each client will make to the center has to be included in the calculations as well. In all four counties most women seek prenatal care during the first trimester and almost all the rest during the second. For those who would use the facility in the first trimester the model assumes a total of eight visits. For those who wait until the second trimester the model assumes six encounters. Since in the four study counties less than two percent either wait until the third trimester or do not seek care, the model assumes that 80 percent seek care in the first trimester and the rest in the second.

For all four counties the number of births has remained relatively stable over the past five years. But the last year does show an increase in the northeastern counties. This may be due to an “overflow” from the fast population expansion in Berkley and Jefferson counties. The model assumes that the number of births will remain at their five year averages.

Given the above assumptions the number of women who potentially may seek prenatal care is provided in Table 5. The estimation in Region II is slightly more than 1/3 of the estimation in Region I. This reflects the population density of both regions.

Table 5
Estimated Number Seeking Rural Prenatal Services

Region	Year 1	Year 2	Year 3+
I	130	260	338
II	46	93	120

The data for the expected number of visits is provided in Table 6. The estimated number of visits increases from 988 in Region I in year 1 to 1,976 in the second year to 2,569 in the third and subsequent years. In Region II the respective yearly totals are 349, 707 and 912.

Table 6
Estimated Visits to Rural Prenatal Clinics

Year One					
Region	First Visit in First Trimester		First Visit in Second Trimester		Total Year One
	Number	80% X 8	Number	20% X 6	
I	130	832	130	156	988
II	46	294	46	55	349
Total					1,337
Year Two					
Region	First Visit in First Trimester		First Visit in Second Trimester		Total Year Two
	Number	80% X 8	Number	20% X 6	
I	260	1664	260	312	1976
II	93	596	93	112	708
Total					2,684
Year Three					
Region	First Visit in First Trimester		First Visit in Second Trimester		Total Year Two
	Number	80% X 8	Number	20% X 6	
I	338	2163	338	406	2569
II	120	768	120	144	912
Total					3,481

The final step in determining the effective demand is to estimate the income which will flow to each of these centers. For purposes of this model, it is assumed that each visit will generate a reimbursement of \$75.00. This is the current reimbursement rate for Medicare Economic Index (MEI). No increase in remuneration is assumed, but in all probability the amount would increase as the MEI rises. It may also be that other services are performed during the visit for which collections can be made, but these are not included as their incidence cannot be predicted.

Table 7 shows the anticipated revenues for each of the regions given the assumptions regarding usage and charges made above. This estimated effective demand can be compared to the estimated cost of service delivery as discussed in the following sections to ascertain if any of the three rural prenatal clinics is economically feasible.

For purpose of analysis, the model assumes reimbursement at \$75 per visit which is the current rate under federal programs. This reimbursement rate does not include all services which the rural health clinic may provide. For that reason the revenue projections should be viewed as conservative.

Table 7
Anticipated Revenues

Region	Year 1	Year 2	Year 3
I	74,100	148,200	192,675
II	26,175	53,100	68,400

Rural Prenatal Delivery Models

This disparity suggests that there are three different “models” for delivery of prenatal care in rural settings.

1. The first, which is most suitable for areas with sufficient effective demand, is a “free standing” rural health center. This clinic is staffed with one midwife, one nurse, one nurse’s assistant and a clerical worker/receptionist. It will have its own facility with a reception area, clerical billing office, four exam rooms (one of which will be equipped to handle emergency deliveries), education/conference room and break room. It will require approximately 4,000 square feet with adequate parking.
2. Another is a “visiting specialist” model. Under this approach, an existing facility is used with the nurse-midwife visiting weekly and an OB/GYN coming monthly. This model assumes that a facility is available and has space that is not being used or could be freed to accommodate the visitors and their clients. In either case, the facility would have to be remodeled to allow for properly equipped exam rooms. Under this model staff already at the facility could be used if available. If not, the nurse and nurses’ assistants would need to accompany the midwife and doctor.
3. A final alternative would be a “mobile clinic.” Under this model the providers come to the woman. This approach has been highly successful because of its flexibility. Its success has been demonstrated repeatedly in the delivery of medical services to remote areas including those in West Virginia. The major upfront expense is the vehicle and it depends on how the vehicle is outfitted. After contact with several dealers the estimated cost of a mobile unit including mammography is \$337,953. Removal of the mammography capability lowers the cost to \$225,395.

While there are many variants of these three models, they do represent the three approaches that are most likely to be economically viable. Given the population density and corresponding potential demand, any of the models could be adapted to fit the unique circumstances of the region. Given the projected effective demand as determined above, the feasibility of all three models is estimated.

Stand Alone Facility

The first option considered was the use of a stand alone facility. The practice would be open 40 hours a week including some night and weekend openings. It would be staffed by one midwife, one LPN, a nurse's assistant and a clerical person.

Under this approach a suitable building would be rented. The rent as derived from slightly below average rents for Class A buildings in the area is \$10.00 per square foot per year. It is assumed that buildings in rural areas rent for less than those in urban areas of the State. The average costs of other facilities were provided from one of the sources listed above.

Estimated costs and revenues using these figures for both regions are arrayed in Models I and II.

Model 1
Estimated Annual Capital & Operating Costs for Rural Health Facility
Stand Alone Facility – Region I

	Year 1	Year 2	Year 3
Building Costs			
Rent	40,000	40,000	40,000
Electricity and Gas	2,185	2,185	2,185
Water, Sewer, Trash	497	497	497
Maintenance	956	956	956
Janitor	2,866	2,866	2,866
Insurance - Equipment Only	313	313	313
Other Miscellaneous	500	500	500
Total Annual Building Costs	47,317	47,317	47,317
Office Costs			
Telephone	1,500	1,500	1,500
Office Supplies	500	1,000	1,300
Office Equipment Maintenance	300	300	300
Billings	250	500	650
Total Annual Office Costs	2,550	3,300	3,750
Medical Costs			
Equipment Maintenance	1,685	3,370	4,381
Medical Supplies	5,230	10,460	13,598
Malpractice Insurance	6,122	6,122	6,122
Total Annual Medical Costs	13,037	19,952	24,101
Personnel			
Midwife	75,000	75,000	75,000
Receptionist-Bookkeeper	16,640	16,640	16,640
Nurse	34,366	34,366	34,366
Nurse Assistant	18,720	18,720	18,720
Total Salary Costs	185,360	185,360	185,360
Benefits	27,932	27,932	27,932
Total Personnel Costs with Benefits	172,658	172,658	172,658
TOTAL ANNUAL OPERATING EXPENSES	235,562	243,227	247,826
TOTAL ANNUAL CAPITAL & OPERATING EXPENSES	297,844	243,227	247,826
REVENUE (Region I)	74,100	148,200	192,675
DEFICIT (Region I)	-223,744	-95,027	-55,151

Model 1
Estimated Annual Capital & Operating Costs for Rural Health Facility
Stand Alone Facility – Region II

	Year 1	Year 2	Year 3
Building Costs			
Rent	40,000	40,000	40,000
Electricity and Gas	2,185	2,185	2,185
Water, Sewer, Trash	497	497	497
Maintenance	956	956	956
Janitor	2,866	2,866	2,866
Insurance - Equipment Only	313	313	313
Other Miscellaneous	500	500	500
Total Annual Building Costs	47,317	47,317	47,317
Office Costs			
Telephone	1,500	1,500	1,500
Office Supplies	177	358	462
Office Equipment Maintenance	106	215	277
Billings	88	179	231
Total Annual Office Costs	1,871	2,252	2,469
Medical Costs			
Equipment Maintenance	595	1,207	1,555
Medical Supplies	1,847	3,748	4,828
Malpractice Insurance	6,122	6,122	6,122
Total Annual Medical Costs	8,565	11,077	12,505
Personnel			
Midwife	75,000	75,000	75,000
Receptionist-Bookkeeper	16,640	16,640	16,640
Nurse	75,000	75,000	75,000
Nurse Assistant	18,720	18,720	18,720
Total Salary Costs	185,360	185,360	185,360
Benefits	27,932	27,932	27,932
Total Personnel Costs with Benefits	172,658	172,658	172,658
TOTAL ANNUAL OPERATING EXPENSES	230,411	233,305	239,949
TOTAL ANNUAL CAPITAL & OPERATING EXPENSES	292,693	233,305	239,949
REVENUE (Region II)	26,175	53,100	68,400
DEFICIT (Region II)	-266,518	-180,205	-166,549

This analysis indicates that a free-standing clinic is not feasible given the assumptions in either region. Demand will not cover the cost of provision. Costs could be reduced by eliminating the nursing assistant, but that is unlikely to change the outcome. The model could come closer to being a self supporting model if the building and utilities were furnished by some governmental or other entity. But as is the case with elimination of the nursing assistant, the free-standing clinic remains economically unfeasible in both regions.

In Region II, under all the model options, there is “excess capacity.” This means that more patients could be accommodated than what is now estimated without any increase in costs. The employees are full time at the free standing clinic or present full time during their visits under the visiting specialist and mobile clinic models. All other costs are fixed and could be spread over an increased patient load.

Visiting Specialists

The second model uses visiting specialists who make periodic visits to existing facilities. The site would be visited once a week by a midwife and once a month by an OB/GYN. It is assumed that staff already present at the facility provide nursing and clerical services as part of the rental. Rent is prorated between the visiting specialists and the regular practice. Travel expenses were derived using distances from existing practices or hospitals where these individuals are currently available.

Model 2
Estimated Annual Capital & Operating Costs for Rural Health Services
Visiting Specialist – Region I

	Year 1	Year 2	Year 3
Building Costs			
Rent	10,000	10,000	10,000
Other Miscellaneous	100	100	100
Total Annual Building Costs	10,100	10,100	10,100
Office Costs			
Telephone	375	375	375
Office Supplies	125	250	325
Total Annual Office Costs	500	625	700
Medical Costs			
Equipment Maintenance	421	843	1,095
Medical Supplies	1,308	2,615	3,400
Malpractice Insurance	1,531	1,531	1,531
Total Annual Medical Costs	3,259	4,988	6,025
Personnel			
Midwife	15,000	15,000	15,000
OB/GYN	15,000	15,000	15,000
Total Salary Costs	30,000	30,000	30,000
Benefits	5,790	5,790	5,790
Total Personnel Costs with Benefits	35,790	35,790	35,790
Travel			
Midwife	5,029	5,029	5,029
OB/GYN	5,029	5,029	5,029
Total Travel Costs	10,058	10,058	10,058
TOTAL ANNUAL OPERATING EXPENSES	59,708	61,561	62,674
TOTAL ANNUAL CAPITAL & OPERATING EXPENSES	70,804	61,561	62,674
REVENUE (Region I)	74,100	148,200	192,675
SURPLUS (Region I)	3,296	86,639	130,001

Model 2
Estimated Annual Capital & Operating Costs for Rural Health Services
Visiting Specialist - Region II

	Year 1	Year 2	Year 3
Building Costs			
Rent	10,000	10,000	10,000
Other Miscellaneous	100	100	100
Total Annual Building Costs	10,100	10,100	10,100
Office Costs			
Telephone	375	375	375
Office Supplies	44	125	125
Total Annual Office Costs	419	500	500
Medical Costs			
Equipment Maintenance	149	302	389
Medical Supplies	462	937	1,207
Malpractice Insurance	1,531	1,531	1,531
Total Annual Medical Costs	2,141	2,769	3,126
Personnel			
Midwife	15,000	15,000	15,000
OB/GYN	15,000	15,000	15,000
Total Salary Costs	30,000	30,000	30,000
Benefits	5,790	5,790	5,790
Total Personnel Costs with Benefits	35,790	35,790	35,790
Travel			
Midwife	5,029	5,029	5,029
OB/GYN	5,029	5,029	5,029
Total Travel Costs	10,058	10,058	10,058
TOTAL ANNUAL OPERATING EXPENSES	58,509	59,218	59,575
TOTAL ANNUAL CAPITAL & OPERATING EXPENSES	69,605	59,218	59,575
REVENUE (Region II)	26,175	53,100	68,400
DEFICIT/SURPLUS (Region II)	-43,430	-6,118	8,825

Given the assumptions of the model, this approach is financially viable in the first year for Region I and becomes slightly feasible for Region II by the third year. Costs could be reduced further if the existing practice did not charge rent or if the rent were covered by some other source, in which case the model becomes self-supporting in year 2 for Region II. It should be noted that there is excess capacity in Region II as there was in the first model.

Mobile Clinic

A third model is to deliver the prenatal service by means of a mobile clinic that would visit both sites on a rotating basis. Services would be available on alternate days in each location. The same staffing requirements as for the stand alone facility in Model 1 were used. Instead of paying rent, the cost of a mobile unit would need to be covered.

The model assumes the mobile unit would be on lease-purchased over a five year period. Acquisition costs for the mobile unit were obtained from dealers. The costs of operating and maintaining the mobile unit would be an additional expense. These costs are estimated in Appendix B.

Model 3
Estimated Annual Capital & Operating Costs for Rural Health Mobile Facility
Mobile Unit – Regions I & II

	Year 1	Year 2	Year 3
Vehicle			
Lease Purchase	42,918	42,918	42,918
Total	42,918	42,918	42,918
Office Costs			
Office Supplies	169	250	325
Total Annual Office Costs	169	250	325
Medical Costs			
Equipment Maintenance	570	843	1,095
Medical Supplies	1,769	2,615	3,400
Malpractice Insurance	1,531	1,531	1,531
Total Annual Medical Costs	3,870	4,988	6,025
Personnel			
Midwife	75,000	75,000	75,000
Nurse	34,366	34,366	34,366
Nurse Assistant	18,720	18,720	18,720
Clerical	16,640	16,640	16,640
Total Salary Costs	185,360	185,360	185,360
Benefits	27,932	27,932	27,932
Total Personnel Costs with Benefits	172,658	172,658	172,658
Vehicle Operating Expenses			
Fuel/Generator Fuel & Service Costs	28,812	28,812	28,812
Insurance & Fees	17,675	17,675	17,675
Total Travel Costs	46,487	46,487	46,487
TOTAL ANNUAL OPERATING EXPENSES	266,102	267,301	268,413
TOTAL ANNUAL CAPITAL & OPERATING EXPENSES	296,102	267,301	268,413
REVENUE (Region I & II)	100,275	201,300	261,075
DEFICIT/SURPLUS (Region I & II)	-195,827	-66,001	-7,338

The results of the calculation indicate that this approach does not produce self-sufficiency and this result is due to insufficient effective demand. However, when the five year lease purchase period is completed the model comes closer to the goal of covering costs.

One modification to the model is to have it cover four regions instead of just two. Assuming the effective demand for the two new regions parallels that in the two regions previously modeled the mobile clinic option becomes self sufficient. Under this alternative model the clinic rotates among the four sites. The evaluation below provides the costs and revenues for this alternative to Model 3.

Model 3 Modification
Estimated Annual Capital & Operating Costs for Rural Mobile Facility
Mobile Unit – Region I – IV

	Year 1	Year 2	Year 3
Vehicle			
Lease Purchase	42,918	42,918	42,918
Total	42,918	42,918	42,918
Office Costs			
Office Supplies	250	500	650
Total Annual Office Costs	250	500	650
Medical Costs			
Equipment Maintenance	843	1,685	2,191
Medical Supplies	2,615	5,230	6,799
Malpractice Insurance	3,061	3,061	3,061
Total Annual Medical Costs	6,519	9,976	12,051
Personnel			
Midwife	75,000	75,000	75,000
Nurse	68,732	68,732	68,732
Nurse Assistant	18,720	18,720	18,720
Clerical	16,640	16,640	16,640
Total Salary Costs	260,360	260,360	260,360
Benefits	34,565	34,565	34,565
Total Personnel Costs with Benefits	213,657	213,657	213,657
Vehicle Operating Expenses			
Fuel/Generator Fuel & Service Costs	28,812	28,812	28,812
Insurance & Fees	17,675	17,675	17,675
Total Travel Costs	46,487	46,487	46,487
TOTAL ANNUAL OPERATING EXPENSES	309,830	313,538	315,762
TOTAL ANNUAL CAPITAL & OPERATING EXPENSES	339,830	313,538	315,762
Combined Revenue (Region I – IV)	200,250	402,600	522,150
DEFICIT/ SURPLUS (REGIONS I-IV)	-139,580	89,062	206,388

This model indicates self sufficiency by the second year and a significant positive return in year three. When the lease-purchase expense is covered in year five, the model would generate an even greater rate of return. The creation of a capital replacement fund to replace the mobile unit should be included as a cost beginning with the sixth year.

Also the cost of the mobile unit could be covered by a federal grant or private contribution. Funds from both potential sources are available. As is the case with lease-purchase a capital recovery fund should be instituted to cover the cost of a new unit when the existing one reaches the end of its useful life. If the mobile unit is paid from sources other than clinic funds, the capital recovery fund should be in the first year when costs are exceeded by revenue

Break Even Analysis

The purpose of a Break Even Analysis is to demonstrate what the level of effective demand would have to be in order to make each model option self –sufficient. In the cases analyzed to this point in the report, it is clear that limited demand for the service is the greatest single problem in making these options economically feasible.

Break Even Analysis Free Standing Clinic

	Region I	Region II
Fixed Costs	Year 1	Year 1
Staff salaries and benefits	221,134	221,134
Equipment purchases	62,282	62,282
Rent	47,317	47,317
Telephone, maintenance, insurance	7,622	7,622
	289,879	289,879
Variable costs		
Equipment Maintenance	1,985	701
Office supplies	500	177
Medical supplies	5,230	1,847
Billings	250	88
	7,965	2,813
Average price per visit	\$75.00	\$75.00
Estimated annual visit volume	988	349
Variable cost per visit	\$8.06	\$8.06

Quantity = Fixed costs/Price-Variable Costs

$$Q = \$289,879 / \$75.00 - \$8.06$$

$$Q = \$289,879 / \$66.94$$

$$Q = 4,331 \text{ visits annually}$$

What the break even analysis shows is that, for a free-standing clinic to be self sufficient, 4,331 visits annually would be required. This represents a 25 percent increase over the projected effective demand.

Break Even Analysis Visiting Specialist

Region I	
Fixed Costs	Year 1
Staff salaries and benefits	45,848
Equipment purchases	11,096
Rent	10,100
Telephone, maintenance, insurance	1,906
	68,950
Variable costs	
Equipment Maintenance	421
Office supplies	125
Medical supplies	1,308
	1,854
Average price per visit	\$75.00
Estimated annual visit volume	988
Variable cost per visit	\$1.88

$$\text{Quantity} = \text{Fixed costs} / \text{Price} - \text{Variable Costs}$$

$$Q = \$68,950 / \$75.00 - \$1.88$$

$$Q = \$68,950 / \$73.12$$

$$\mathbf{Q = 943 \text{ visits annually}}$$

*Region I is near capacity for given staff

For the visiting specialist model in Region 1 to be self sufficient, 943 interventions are required. This means that in Region 1, giving the level of staffing by year 3, it would be close or near capacity. If full capacity is reached, then additional staff would need to be hired. Additional staff would not be fully utilized if full-time. In order to maintain self-sufficiency, only part-time staff could be used.

Break Even Analysis Mobile Clinic

Regions I & II	Year 1
Fixed Costs	
Staff salaries and benefits	174,189
Equipment purchases	72,918
Vehicle Insurance and Fees	17,675
	264,782
Variable costs	
Equipment Maintenance	570
Office supplies	169
Medical supplies	1,769
Fuel & Service	28,812
	31,320
Average price per visit	\$75.00
Estimated annual visit volume	1,337
Variable cost per visit	\$23.43

Quantity = Fixed costs/Price-Variable Costs

$$Q = \$264,782 / \$75.00 - \$23.43$$

$$Q = \$264,782 / \$51.57$$

$$Q = 5,135 \text{ visits annually}$$

Break Even Analysis Mobile Clinic

Regions I - IV	Year 1
Fixed Costs	
Staff salaries and benefits	216,718
Equipment purchases	72,918
Vehicle Insurance and Fees	17,675
	307,311
Variable costs	
Equipment Maintenance	843
Office supplies	250
Medical supplies	2,615
Fuel & Service	28812
	32,520
Average price per visit	\$75.00
Estimated annual visit volume	2674
Variable cost per visit	\$12.16

Quantity = Fixed costs/Price-Variable Costs

$$Q = \$307,311 / \$75.00 - \$12.16$$

$$Q = \$307,311 / \$62.84$$

$$Q = 4,891 \text{ visits annually}$$

Conclusions

The purpose of this study was to investigate the feasibility of establishing rural prenatal services. To make that evaluation, three models were used: The creation of a free standing clinic; using visiting specialists in existing facilities; and establishing a mobile facility. For demonstration purposes, two regions in West Virginia consisting of two counties each were used. None of these counties have existing access to prenatal services within a 30 minute drive.

Given the results of the analysis, the use of a free-standing facility must be rejected as it does not provide self-sufficiency at any time during the study period. The visiting specialist model appears to be the best alternative given the level of effective demand. The mobile clinic also holds promise as a delivery system if a sufficient number of additional counties are added to the service area.

The key to self sufficiency is effective demand for services. If any of these three models is used, it must be combined with an outreach and promotional program to capture all the possible demand that might exist in the areas being served. The cost of these efforts has not been included in the models, but they would have to be covered.

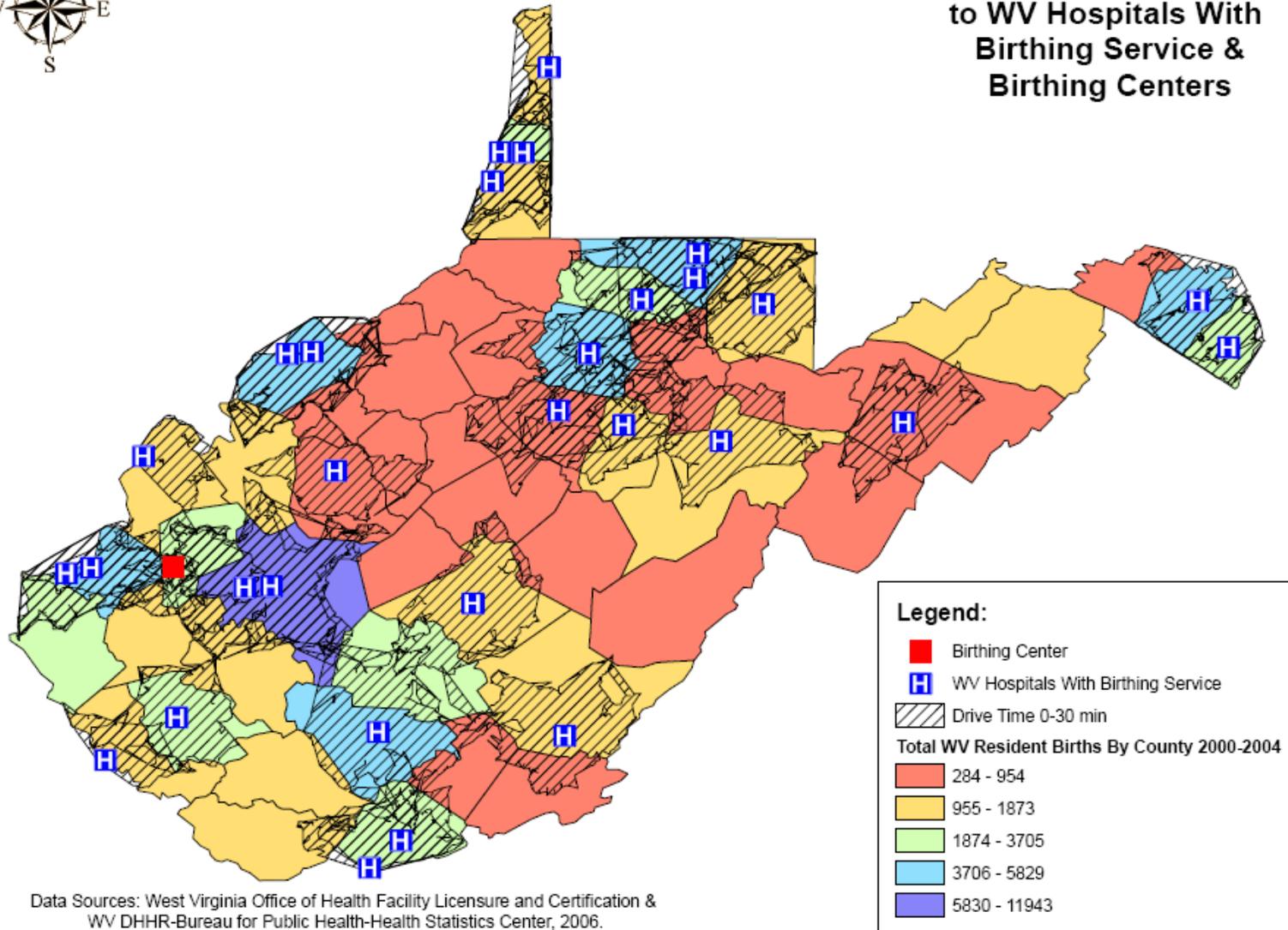
In all cases, this report has used conservative estimates. Particularly in the case of effective demand, there has been a reluctance to overestimate and make the models appear more attractive. Using conservative estimates reduces the possibility that policy mistakes will be made on the basis of unrealistic expectations.

What must be given consideration in making the decision about providing rural prenatal care is the benefits to be derived. As a companion piece to this report shows, these benefits in reduced costs to the family, state and private insurers are considerable. If these benefits in the form of reduced costs associated with poor or lack of prenatal care can be achieved, then provision under any of these models would make economic sense.

Appendix A



30 Minute Drive Time to WV Hospitals With Birthing Service & Birthing Centers



Data Sources: West Virginia Office of Health Facility Licensure and Certification & WV DHHR-Bureau for Public Health-Health Statistics Center, 2006.
 Map Updated By Jennings Starcher, WV Health Care Authority, April 2, 2007.

Appendix B Annual Operating Cost Worksheet

Fuel Mileage

26,000 divided by 6 mpg equals 4,334 times \$3.00 equals \$13,002
 Estimated Annual Mileage Annual Total Gallons Fuel Cost Per Gallon Total Fuel Expense

*Transit vehicle operation at approximate 6-8 miles per gallon.

Generator Operation

8 times 260 times .75 gal/hr equals 1,560 times \$3.00 equals \$4,680
 Average Daily Hours Annual Days of Operation Total Gallons Used Average Cost for Gallon Total Fuel Expense

Engine Service

26,000 divided by 4,000 miles equals 6.5 times \$100.00 equals \$650.00
 Total Annual Mileage Annual Times For Service Total Annual Cost

*Recommended service interval 4,000 miles

*\$100.00 estimated service cost.

Generator Service

8 times 260 divided by 100 hours equals 21 times \$30.00 equals \$630
 Average Daily Hours Annual Days of Operation Annual Times For Service Total Annual Cost

*100 hour recommended service interval.

Transmission Service

26,000 divided by 15,000 miles equals 2 times \$100.00 equals \$200
 Annual Mileage Annual Times For Service Annual Total Cost

*15,000 miles recommended service interval. *\$100.00 estimated service cost.

Tire Expense

26,000 divided by 45,000 miles equals .5 times \$1800.00 equals \$900.00
Annual Annual Annual
Mileage Times For Total
Replacement Cost

*45,000 50,000 miles estimated tire life. *Estimated tire cost of six tires at \$300.00 each

Washing and Cleaning

Expense based on local application.

Other Expenses To Consider In Figuring Total Operating Costs

Parking and storage	\$ <u>2,400</u>
Insurance	\$ <u>15,000</u>
Driver licensing fees, annual physicals, etc.	\$ <u>200</u>
Local and state registration and tax in non-exempt.	\$ <u>75</u>
TOTAL EXPENSE	\$ <u>17,675</u>

Total Annual Expense Tabulation

Vehicle Fuel Expense	\$ <u>13,002</u>
Generator Fuel Expense	\$ <u>4,680</u>
Engine Service	\$ <u>6,500</u>
Generator Service	\$ <u>630</u>
Transmission Service	\$ <u>200</u>
Tire Replacement	\$ <u>900</u>
Cleaning	\$ <u>2,400</u>
Other	\$ <u>500</u>
Total Annual Expense	\$ <u>28,812</u>

Appendix C Operating Assumptions

Common to all models

Personnel Rates	
OB/GYN	\$300,000
Midwife	\$75,000
Nurse	\$34,366
Nurse Assistant	\$18,720
Receptionist	\$16,640
Benefit rate	
All staff	19.3%

Model 1 – Free Standing Clinic

- Staffed with a midwife, nurse, nurse’s assistant and receptionist/clerical worker
- Facility will have reception area, billing office, four exam rooms, conference room and break room
- One of the four rooms will be equipped to handle emergency deliveries
- Approximately 4,000 square feet at an annual rental of \$40,000
- Excess capacity would allow for increase in demand for services
- Capital equipment and small office equipment purchases in year 1 @ \$62,282

Model 2 – Visiting Specialist

- Visiting specialist would be weekly visits from a midwife and monthly visits by an OB/GYN physician
- Annual personnel rates adjusted for 20% of midwife’s salary and 5% for OB/GYN
- Additional compensation for travel time & expense based on 2 hours/ 60 miles per day
- Existing facility would be paid rent for 1,000 square feet @ \$10 per sf
- One exam room would be outfitted with necessary equipment
- Office and medical supplies at 25% of free standing rate
- Equipment charges at 25% of free standing facility room rate
- Region I is near capacity serving 15 patients per day with current staff numbers
- Billing and minor office expenses covered by miscellaneous charge assumed to be done by current facility and reimbursed

Model 3 – Mobile Clinic (Serving Region I & II)

- Mobile Clinic built on Chevrolet C5500 chassis GVWR 18,000 lbs
- Cummins-Atlantic 20kW Quiet Diesel generator
- Equipped with one exam room with one Ritter Exam Table #204

- One Ritter operator stool #183
- Clerical space including reception desk, steno chair with bungee securement
- Bench seating
- Literature/Brochure racks
- Custom cabinetry
- One CAT 6 outlet routed to central location
- Additional equipment – mobile ultrasound unit \$30,000
- Staffed with a midwife, nurse, nurse’s assistant and receptionist/clerical worker
- Safety equipment – fire extinguisher, back up alarm, first aid kit and reflective triangles

Model 4 – Mobile Clinic (Serving Two Additional Regions III & IV)

- Same vehicle assumptions as Model 3
- Service area extended to include two additional rural regions
- Similar demand characteristics as Regions I & II
- Increase in economy of scale leaves base assumptions the same
- Excess capacity is in fixed costs
- Additional costs included for supplies and equipment maintenance