SHDP : AN EXPERIMENT IN SUCCESS THAT FAILED*

STEPHANIE REZANSOFF

Public policy generally, and health policy specifically, is currently in a state of massive re-examination and reform. Driven largely by deficit terrorism, the health sector has undergone, and is undergoing, extensive reform. A common theme of the debate is that change should be rooted in evidence-based decision making. The purpose of this paper is to examine the introduction in 1974 and the demise in 1987 of the Saskatchewan Health Dental Plan, with particular emphasis on "evidence" shaping public policy. The policy will be examined in terms of how it met three criteria: 1) public acceptance; 2) cost effectiveness; and 3) quality of service. We will begin by presenting the plan and its features. Next an evaluation in the aforementioned three areas will be presented. The concluding section will draw together the results of these analyses.

THE PLAN

A low population interspersed over a vast area of land has always presented problems for the people of Saskatchewan, especially with regard to education and health services. These circumstances were the driving force behind Saskatchewan's innovative public policies that ultimately lead up to the establishment of Canada's first Medicare plan in 1962. Six years later, the dental health division of the Saskatchewan Department of Public Health conducted a dental survey of school aged children in Saskatoon and Regina and concluded that the level of dental care was not adequate. Further analysis showed that aside from a maldistribution of dental manpower (concentrated in Saskatoon and Regina), there was a "clear-cut" shortage of dentists. These findings prompted an reorientation of dental care policies towards the concept of school-based dental care provided by dental nurses (as originated in New Zealand in 1921). Thus the Saskatchewan Dental Plan incorporated two policy objectives. The first objective was to address the underlying need by removing the financial barrier to services which fee for service presented. The second objective was to introduce a new delivery modality — school based dental assistants.[1] Through effective use

*An earlier version of this paper was prepared for Econ 234, for Professor Glen Beck at the University of Saskatchewan.

[1] Dr. Ambrose, Dr. Hord, and Dr. Simpson, *A Quality Evaluation of Specific Dental Services Provided By The Saskatchewan Dental Plan* 1976.

of manpower, the SDHP hoped to keep its costs lower than could have been achieved using private practice dentists.

The plan itself was initiated in 1972 with the establishment of a two year dental nursing program at the Wascana Institute of Applied Arts and Science in Regina. With the graduation of the first students in 1974, the Dental Care Act was passed and the SHDP became operational. Dental nurses took over most of the responsibility for the children's dental care, and were able to do this largely independently of dentist supervision.

The Province of Newfoundland also had a dental program but it had several differentiating characteristics. Newfoundland's program, implemented in 1954, concentrated on professionals who are more expensive to train and pay — the conventional dentist. (In 1976, dental nurses earned approximately $13,000, compared to dentists, who earned approximately $40,000). Because salaries of dental care staff make up the larger proportion of any plan expenditures — from 63 to 74%, it would make sense to make use of less expensive personnel provided the quality of care did not suffer.

EVALUATION:

a) ***Public Acceptance***

Enrollment in the plan provided for an element of public choice. Parents were encouraged to enroll their children, but were given the option to seek the care of private practitioners if they preferred. Thus, an examination of enrollment data permits some assessment of the degree of public acceptance of the plan.

The program actually began in September, 1974 with an enrollment of 13,140 children and adolescents. The following year, another 24,431 patients were included in accordance with a plan to bring successive age groups on stream. Children were enrolled as follows:

Table 1

ENROLLMENT DATE	DATE OF BIRTH
Sept. 1974	1968
Sept. 1975	1969, 1970
Sept. 1976	1967, 1971
Sept. 1977	1972
Feb. 1978	1973
Sept. 1978	1966, 1974
Sept. 1979	1975
Sept. 1980	1976
Sept. 1981	1977
Sept. 1983	1978
Sept. 1984	1979

Originally, the program was to provide care to children between the ages of 3 and 12. In 1978, it was expanded to include children between the ages of 3 and 14. (*Saskatchewan Dental Health Plan Report* 1984)

Enrollment continued to climb, with an average growth rate of 30%, until termination of the plan in September of 1987. (Rate of growth in enrollment tapered off in later years, as most eligible children in the province were enrolled.) (See Appendix A)

The plan was based on a major modification on the delivery side. Dental care for children was shifted from the private practice setting to a publicly financed school setting. It implemented a team approach to providing dental services in schools, resulting in "better coordination with school activities, keeping children within the familiar surroundings of their own school, minimum class disruption and a minimum of working time lost by dental teams because of missed appointments or having to transport patients." (Saskatchewan Dental Health Plan Report 1974 -86 issues) It also featured the training and establishment of dental nurses and assistants.

Every enrolled child and adolescent was examined once a year. Parents were contacted prior to their childrens' initial visits, where their medical history was checked and diagnostic X-rays taken if required. A full clinical examination was given on the second visit and a treatment plan was devised for each child. Actual treatment began on the third visit, where a dental therapist and certified dental assistant carried out treatment according to the treatment plan.

Because the Plan used dental assistants with a possible perception of a loss in quality of care as compared with the traditional dentist, public acceptance is a critical factor. However, the data for enrollment by age category indicate a high degree of acceptance. Malcolm Brown's (University of Calgary) economic evaluation of childrens' dental care programs in both Saskatchewan and Newfoundland shows that Saskatchewan managed to enroll about 80% of children in eligible age groups, compared with 45% in the Newfoundland program (which concentrated on the care of children under 11). "Children opting out of the Saskatchewan plan do so because their parents wish to arrange private care with dentists; it must be concluded that the Saskatchewan system is leading to much better dental coverage."[2] High enrollment is a major strength of school-based plans, as parents must arrange for private dental care if they choose not to use the service. Clearly there appears to be little evidence of a lack of public acceptability.

b) ***Cost Effectiveness***

A critical aspect of the dental program was, of course, the change in delivery modality. Clearly then, the cost effectiveness of the program must be a central issue in evaluating cost per child. Several studies examined the cost performance of the SHDP. Brown (1980) compared the Saskatchewan plan with Newfoundland (where dental care was primarily provided for by private dentists on a fee for service basis). Lewis examined the plan over the period 1974-1980.

The cost data from the Saskatchewan Dental Plan Report (1986) are presented in Table 2. Figure A presents the behaviour of the data over time in a visual manner. Both total program costs and costs per enrolled child are presented.

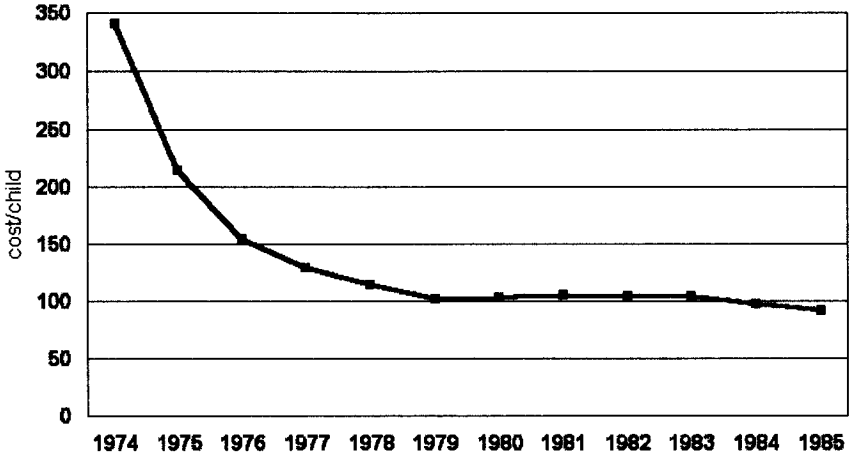
[2] Malcolm C. Brown, An Economic Evaluation of the Newfoundland and Sakatchewan Children's Dental Care Programs (University of Calgary, 1980) 176.

Table 2

YEAR	TOTAL COST	# ENROLLED	COST/CHILD
1974-75	$4,492,372.64	13,140	$341.89
1975-76	$8,056,250.24	37,571	$214.43
1976-77	$9,315,780.24	60,231	$154.67
1977-78	$10,907,790.21	84,052	$129.77
1978-79	$12,574,681.22	109,751	$114.57
1979-80	$12,488,043.73	122,139	$102.24
1980-81	$13,936,241.40	134,637	$103.48
1981-82	$16,444,794.14	155,481	$105.77
1982-83	$16,698,968.98	159,946	$104.40
1983-84	$16,875,923.81	161,784	$104.31
1984-85	$16,085,709.65	165,101	$97.43
1985-86	$15,326,415.58	166,634	$91.98

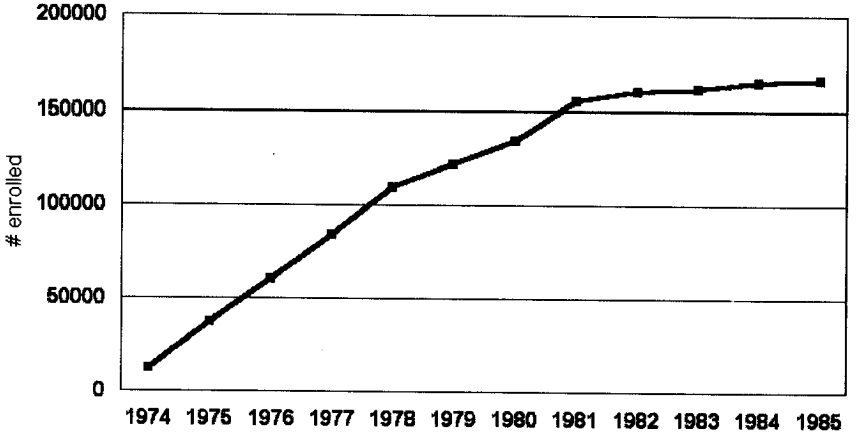
* these numbers have been adjusted for inflation and are expressed in 1986 constant dollars.

Figure A



Year

Figure B



Declining average cost per child could be attributable to movement down the U-shaped average cost curve of the firm as individual clinics increased their output. But it could also be attributable to economies of scale as increased enrollment permits the establishment of larger clinics. Brown opts for the economies of scale interpretation. Without further information on the size and number of firms (clinics) that were used it is difficult to reach definitive conclusions on the source of the cost behaviour. However one conclusion can be drawn from the costs of the SHDP in terms of cost per individual child. The cost of treating a child under this plan fell by over 271% — from $341.89 in 1974 to $91.98 in 1986. This indicates that the rate of growth of costs associated with this program was probably not the source of its demise.

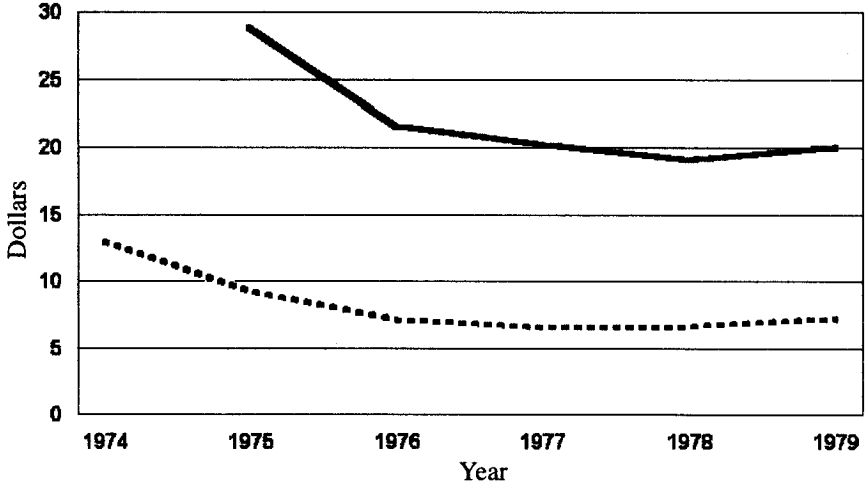
D.W. Lewis (*Performance of the SHDP 1974-80.* University of Toronto, 1981. P 71) provides a direct assessment of two efficiency criteria: cost per visit and cost per service for the years 1974 to 1980 (using unadjusted costs). These data are reproduced in Table 3 and Figure C.

Table 3: Cost Per Visit And Cost Per Service

SHDP PROGRAM YEAR	COST PER VISIT*	COST PER SERVICE**
1974-75	unknown	$12.99
1975-76	$28.89	9.30
1976-77	21.63	7.16
1977-78	20.24	6.51
1978-79	19.07	6.61
1979-80	20.03	7.19

*Actual cost of services divided by number of visits for appropriate program years.
**Actual cost of services divided by grand total of services for appropriate program years.

Figure C



This data does not contradict the conclusions reached based on Brown's findings. But Lewis stresses that while "the time-series data seem to point to increasing efficiency over the first four or five program years, followed by a levelling off, content of visits and characteristics of the services provided are probably changing over time." What Lewis is referring to is the group of older children that began to be enrolled. They undoubtedly presented a difference in morbidity and this is reflected in a change in service mix.

Saskatchewan's cost performance may also be evaluated in light of the performance of other provinces' insurance plans for children. Lewis's data for four other provinces are reproduced in Table 4. As the data indicate, SHDP costs are actually equal to or lower than the costs of other provincially insured children's plans.

Table 4
PROVINCIAL CHILDREN'S DENTICARE COST PER CHILD* COMPARISONS
(Lewis, D.W. *Performance of The Saskatchewan Health Dental Plan 1974-80.* University of Toronto, 1981. P73)

YEAR	QUEBEC	NOVA SCOTIA	NEWFLD.	SHDP
1974	$52.92	-	$28.25	$163.05
1975	60.80	$56.06	44.09	109.48
1976	64.35	48.63	45.49	83.70
1977	65.30	53.13	42.86	73.83
1978	59.23	58.61	54.41	70.01
1979	85.74	65.28	-	68.0

*Administrative travel and capital costs are included only for SHDP.

According to Lewis, SHDP provides about 33% to 50% more services per patient, and about the same number per patient as in Quebec. Thus the inter-provincal data confirm our previous conclusion that cost performance could not have been a driving force in the Plan's demise.

Focusing on the administration costs of the program as distinct from the service costs, data are not available to permit extensive analysis. However, it is known that administration costs for the SHDP are approximately $5.00 to $5.50 per child per year. Adjusting SHDP costs by this amount (i.e. 73.83 - 5.50 = 68.33) and also for capital expenditures suggests the Saskatchewan plan achieved equal or lower costs. Comparative data for the Newfoundland and Saskatchewan plans specifically, support the above suggestion, since the SHDP maintained a higher enrollment and provided a wider range of services, including preventative care. Unfortunately no reliable comparative data were available for the private sector fee-for-service delivery modality.

c) ***Quality of Care***

Quality of care must be included in any evaluation. If lower cost is associated with lower quality, the cost evidence must be viewed in a different light. Numerous quality evaluations of the SHDP have concluded that the quality of care received through the program was comparable, and in most cases superior, to that offered by private dentists. A major quality assessment of the program was sponsored by the Saskatchewan Department of Health (1976). It featured three outside dental experts,[3] of which one from McGill later migrated to Saskatchewan to become the Dean of Dentistry. It concluded that dental nurses did better amalgam restorations work than dentists and just as good work in all other areas.

A total of 2107 amalgam restorations in 410 children were surveyed. Restorations were rated as follows:

Table 5

UNACCEPTABLE		ADEQUATE		SUPERIOR	
Dentists	Dental Nurses	Dentists	Dental Nurses	Dentists	Dental Nurses
21.1%	3.7%	62.4%	48.6%	16.5%	47.7%

(Saskatchewan Dental Health Plan Reports 1980-81)

Brown, in endorsing this quality assessment, suggests "nurses placed better fillings because they have been more conscientious at it and because they do not have any financial incentive to maximize quantity at the expense of quality."[4] Of course the quality assessment would surely hinge on more than workload, but Brown presents no data on the comparative workload of private dentists versus dental assistants. The reference to financial incentives should not detract from the strong evidence that quality of care provided by dental assistants was more than adequate — it was superior. Concern about the quality of care was the focal point of criticisms from private dentists and the official organizations. Indeed, the Society of Dentistry for Children expressed explicit concern regarding the implementtion of a dental program in which the majority of care would be performed by dental nurses.

[3] Dr. E.R. Ambrose, Dean and former chairman of operative dentistry at McGill University; Dr. A.B. Hord, chairman of restorative dentistry at University of Toronto; and Dr.W.J. Simpson, chairman of children's dentistry at University of Alberta.
[4] Brown 179

> "The Society has reservations concerning the use of dental nurses as a chief vehicle to provincial dental services to Saskatchewan children. To deny that dental nurses have filled a void in dental services in the countries where their services have been employed would be a mistake ... yet it would be folly to model our plan after one which is essentially obsolete for this province."[5]

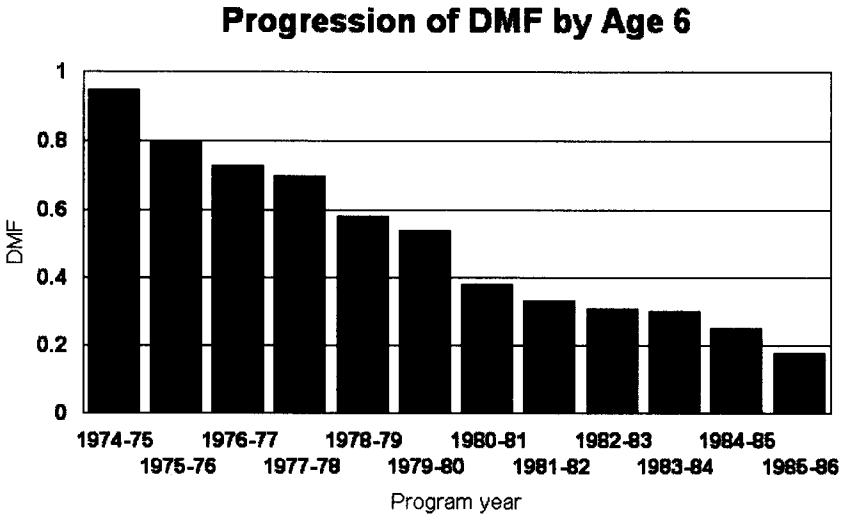
The evidence presented, however, suggests that these concerns were not well founded. The high level of quality of care delivered by dental assistants must remain one of the hallmark achievements of the Saskatchewan Dental Plan.

d) ***Need***

The need for more adequate dental care (identified in 1968 and confirmed in 1971) was, by all accounts, met by the Saskatchewan Dental Plan. The combined quality and coverage of care achieved was impressive, and there is little doubt that the dental health of children in Saskatchewan has improved greatly since its inception.

Clearly there is substantial evidence that the SHDP contributed to the reduction of dental caries prevalence of children in the province. Data on 'decayed missing and filled permanent teeth' for the years 1974 to 1986 in Saskatchewan also support this inference. Figure C shows the dramatic improvement in the number of DMF permanent teeth for six year old children. Thus the Plan unequivocally had a dramatic impact on the underlying morbidity in the Province. There are some who argue that the plan may have been its own nemesis — in the sense that it eradicated its own need.

Figure C



[5] Submission to the Advisory Committee in Dental Care for Children, Jan., 1973

Numerous more recent studies[6] point towards the effectiveness of preventative programs provided by the SHDP as responsible for the marked decrease in dental caries rates and overall improvement in the dental health of Saskatchewan children. These treatments included individual oral hygiene and nutritional instruction, topical applications in fluoride, fissure sealants, and a fluoride mouth rinse program. Effectiveness of fissure sealants in particular is stressed in several analyses, including *An Evaluation of the Saskatchewan Pit and Fissure Sealant Program: A Longitudinal Follow-up* (Ismail, King and Clark). They indicated that, "Dental therapists successfully applied sealants...and the sealants were effective in reducing dental caries incidence in children." They further concluded that the trend of decline in restorative care would have continued in the future if the guidelines for sealant application that were used by the SHDP are adhered to.

SHDP preventative strategy also involved identifying children who were at high risk to dental disease, and providing additional preventative services for those children. The long-term objective of targeting high risk children was to guarantee continued improvement in the dental health of Saskatchewan children, and to ensure that program funds were being spent in the most efficient and effective manner possible.

Conclusion

The Saskatchewan Dental Health Plan has been examined in three dimensions — public acceptance, cost effectiveness, and quality. The evidence indicates that the program received high public acceptance, it delivered superior quality of care, and it featured a cost effective mode of delivery. Its two distinguishing features were its method of delivery and financial access to care i.e. a publicly funded school-based program with care provided for by dental auxiliaries instead of private delivery on a fee for service basis. Province-wide financial access was successful in satisfying the pool of previously unmet need and may, paradoxically, have given rise to the demise of the Plan. However, it also demonstrated a successful alternate delivery mode whose legacy was also lost:

> "Certainly the Saskatchewan model was the flagship of dental public health in Canada and perhaps the world. It demonstrated how remote populations could be reached with dental treatment, how staff (i.e. the dental nurse) need only to be educated to the level required, and how inadequate health may be reversed".[7]

[6] Ismail, A.I., Leake, J.C., Clark, D.C. "An Evaluation of The Saskatchewan Pit and Fissure Sealant Program: A Longitudinal Follow-Up." *Journal of Public Health and Dentistry* Sept. 1989: 206-11.

Whyte, R.J., Leake, J.K.,Howley, T.P. "Two-Year Follow-Up of 11,000 Dental Sealants in the First Permanent Molars in the Saskatchewan Health Plan." *Journal of Public Health and Dentistry* Sept. 1987: 177-81.

[7] (Farrel, Neil 1993)

BIBLIOGRAPHY

Ambrose, Dr. E.R., Hord, Dr. A.B., and Simpson, Dr.W.J. *A Quality Evaluation of Specific Dental Services Provided by the Saskatchewan Dental Plan.* Regina, 1976.

Brown, Malcolm C. *An Economic Evaluation of the Newfoundland and Saskatchewan Children's Dental Care Programs.* University of Calgary, 1980.

Farrel, N.A. "Socialized Dentistry." *Journal of the Canadian Dental Association* June 1993 : 710.

Ismail, A.I., Leake, J.C. and Clark, D.C. "An Evaluation of the Saskatchewan Pit and Fissure Sealant Program: A Longitudinal Follow-up." *Journal of Public Health and Dentistry* September 1989: 206-11.

Lewis, *D.W. Performance of the Saskatchewan Health Dental Plan 1974-80.* University of Toronto, 1981.

Niedermayer, J.W. "Socialized Dentistry For Children in Saskatchewan, Its Beginning — 1974, Its Demise — 1993." *Journal of the Canadian Dental Association* June 1993: 522-3, 527.

Saskatchewan Department of Health (1972-73), *Briefs Submitted to the Minister's Advisory Committee on Dental Care*, Regina.

Saskatchewan Department of Health (1974-75 — 1985-86 issues), *Saskatchewan Dental Plan Report*, Regina.

Saskatchewan Department of Health (*Working Towards Wellness Series*), "A Saskatchewan Vision for Health", Regina.

Whyte, R.J., Leake, J.K. and Howley, T.P. "Two-Year Follow-Up of 11,000 Dental Sealants in First Permanent Molars in the Saskatchewan Health Dental Plan". *Journal of Public Health and Dentistry* September 1987: 177-81.

Young, W. "Targeting Preventative Services in the Saskatchewan Dental Plan." *Journal of the Canadian Dental Association* October 1986: 827-30.