NORTH CAROLINA GENERAL ASSEMBLY
LEGISLATIVE ACTUARIAL NOTE

BILL NUMBER: Senate Bill 153, Sections 1 & 5

SHORT TITLE: Adverse Reactions to Smallpox Vaccination

SPONSOR(S): Senator Rand

SYSTEM OR PROGRAM AFFECTED: Teachers' and State Employees' Comprehensive Major Medical Plan.

FUNDS AFFECTED: State General Fund, State Highway Fund, other State employer receipts, premium payments for dependents by active and retired teachers and State employees, and premium payments for coverages selected by eligible former teachers and State employees.

BILL SUMMARY: Section 1 of the bill covers the necessary medical services for Plan members infected with smallpox, infected from smallpox vaccinia, or suffering any other adverse medical reaction from smallpox vaccinia, resulting from smallpox countermeasures under the federal Homeland Security Act of 2002.

EFFECTIVE DATE: Section 1 of the bill becomes effective when it becomes law.

ESTIMATED IMPACT ON STATE: Based upon information provided by the Comprehensive Major Medical Plan for Teachers and State Employees, Aon Consulting, the consulting actuary for the Plan, and Hartman & Associates, the consulting actuary for the General Assembly's Fiscal Research Division, both state that since the services covered under Section 1 of the bill are already covered by the Plan, there would be no additional cost to the Plan from enactment of Section 1 of the bill.

ASSUMPTIONS AND METHODOLOGY: The Comprehensive Major Medical Plan for Teachers and State Employees is divided into two programs. From October, 1982, through June, 1986, the Plan only had a self-funded indemnity type of program which covered all employees, retired employees, eligible dependents of employees and retired employees, and eligible former employees and their eligible dependents authorized to continue coverage past a termination of employment other than for retirement or disability purposes. A prepaid program of coverage by health maintenance organizations (HMOs) was offered in July 1986 as an alternative to the Plan's self-insured indemnity program. The benefits of the self-insured indemnity type of program are spelled out in Part 3 of Article 3 of Chapter 135 of the North Carolina General Statutes (i.e., $350 annual deductible, 20% coinsurance up to $1,500 annually, etc. paid by the program's members). HMOs are required to offer benefits that are comparable to those provided by the self-insured indemnity program. Beginning in July 2000, firefighters, rescue squad workers, and members of the National Guard and their eligible dependents were allowed to voluntarily participate in the Plan on a fully contributory basis, provided they were ineligible for any other type of group health benefits and had been without such benefits for at least six months. Employer-paid non-contributory premiums are only authorized for the indemnity program's coverage for employees and retired employees. All other types of premium in the indemnity program are fully contributory, except for job-sharing public school teachers who are authorized partially contributory premiums at 50% of non-contributory rates. The Plan's Executive Administrator has set the premium rates for

firefighters, rescue squad workers, and members of the National Guard and their families at 20% more than the comparable rates charged for employees, retired employees, and their families. Premiums paid by employers to HMOs are limited to like amounts paid to the indemnity program with employees and retired employees paying any HMO amounts above the indemnity program's non-contributory rates. Both types of coverage continue to be available in the Plan; however, none of the HMOs with certificates of authority to transact business in North Carolina have offered to participate in the Plan since September 30, 2001. The Plan's employees and retired employees select the type of program that they wish for themselves and their dependents during the months of August and September of each year for coverage beginning in October. The demographics of the Plan as of December 31, 2002, include:

	Self-Insured Indemnity Program	Alternative HMOs	Plan Total
Number of Participants			
Active Employees	280,065	-0-	280,065
Active Employee Dependents	137,841	-0-	137,841
Retired Employees	117,225	-0-	117,225
Retired Employee Dependents	18,999	-0-	18,999
Former Employees & Dependents with Continued Coverage	2,535	-0-	2,535
Firefighters, Rescue Squad Workers, National Guard Members & Dependents	7	-0-	7
Total Enrollments	556,672	-0-	556,672
Number of Contracts			
Employee Only	313,439	-0-	313,439
Employee & Child(ren)	40,978	-0-	40,978
Employee & Family	44,710	-0-	44,710
Total Contracts	399,127	-0-	399,127
Percentage of Enrollment by Age			
29 & Under	26.9%	-0-%	26.9%
30-44	20.9	-0-	20.9
45-54	20.9	-0-	20.9
55-64	16.2	-0-	16.2
65 & Over	15.1	-0-	15.1
Percentage of Enrollment by Sex			
Male	38.3%	-0-%	38.3%
Female	61.7	-0-	61.7

Assumptions for the Self-Insured Indemnity Program: For the fiscal year beginning July 1, 2002, the self-insured program started its operations with a beginning cash balance of $91.6 million. Receipts for the year are estimated to be $1.370 billion from premium collections and $7 million from investment earnings for a total of $1.377 billion in receipts for the year. Disbursements from the self-insured program are expected to be $1.325 billion in claim payments and $38 million in administration and claims processing expenses for a

total of $1.363 billion for the year beginning July 1, 2002. For the fiscal year beginning July 1, 2002, the self-insured indemnity program is expected to have a net operating gain of approximately $14 million for the year. After reserving an additional $15 million for implementation of the claims data and privacy requirements of the federal Health Insurance Portability and Accountability Act (HIPPA) that take effect on and after April 14, 2003, the Plan's self-insured indemnity program is expected to have an available beginning cash balance of $90 million for the fiscal year beginning July 1, 2003. The self-insured indemnity program is nonetheless assumed to be unable to carry out its operations for the 2003-2005 biennium without increases in its current premium rates or a reduction in existing benefits or payments to health care providers or both. This assumption is further predicated upon the fact that the program's cost containment strategies (hospital DRG reimbursements, discounts on hospital outpatient services, pre-admission hospital testing, pre-admission hospital inpatient certification with length-of-stay approval, hospital bill audits, case and disease management for selected medical conditions, mental health case management, coordination of benefits with other payers, Medicare benefit "carve-outs", cost reduction contracts with participating physicians and other providers, a prescription drug benefit manager with manufacturer rebates from formularies, and fraud detection) are maintained and improved where possible. Current non-contributory premium rates are $186.04 monthly for employees whose primary payer of health benefits is Medicare and $244.38 per month for employees whose primary payer of health benefits is not Medicare. Fully contributory premium amounts for employee and child(ren) contracts are $115.78 monthly for children whose primary payer of health benefits is Medicare and $152.32 monthly for other covered children, and $277.68 per month for family contracts whose dependents have Medicare as the primary payer of health benefits and $365.36 per month for other family contract dependents. Claim cost trends are expected to increase 13% annually. Total enrollment in the program is expected to increase less than 1% annually over the next two years. The number of enrolled active employees is expected to show no increase over the next two years, whereas the growth in the number of retired employees is assumed to be 5% per year. The program is expected to have a 2% decrease in the number of active employee dependents per year whereas the number of retiree dependents is expected to increase 2% per year. Investment earnings are based upon a 4.5% return on available cash balances. The self-insured indemnity program maintains a claim stabilization reserve for claim cost fluctuations equal to 7.5% of annual claim payments without reserving additional funds for incurred but unreported claims.

Assumptions for the Indemnity Plan's Coverage of Medical Services Related to Adverse Reactions from Smallpox Vaccinations: A smallpox vaccination (vaccinia) is generally a safe and effective means of preventing smallpox. However, in a number of individuals, smallpox vaccination can result in adverse reactions. Most are totally benign, but may be alarming in appearance. Some are serious, but treatable. A few, which rarely occur, are serious, life threatening and can be fatal. Severe adverse reactions are more common in persons receiving primary vaccinations compared to those being revaccinated. Smallpox vaccination is also contraindicated for persons who have the following conditions or have a close contact with the following conditions: (1) a history of atopic dermatitis (eczema), irrespective of severity or activity; (2) active, acute chronic, or exfoliative skin conditions that disrupt the epidermis; pregnant women or women who desire to become pregnant in the 28 days following vaccination; and (4) persons who are immunocompromised as a result of human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS), autoimmune conditions, cancer, radiation treatment, immunosuppressive medications, or other immunodeficiencies. Additional contraindications apply to vaccination candidates irrespective of their close contact with others which are: women who are breastfeeding, those taking topical ocular steroid medications, those with moderate-to-severe other illnesses, and persons under 18 years of age.

Most people experience normal, typically mild reactions to the smallpox vaccine, which indicate that it is beginning to work. These reactions, which usually go away without treatment, are:

- The arm receiving the vaccination may be sore and red where the vaccine was given.
- The glands in the armpits may become large and sore.
- The vaccinated person may run a low fever.

Studies indicate that 36% of adult primary vaccinees feel bad enough to miss work, school, or recreational activity or have trouble sleeping.

About 1,000 people for every 1 million people vaccinated for the first time experienced reactions that, while not life-threatening, were serious. These reactions, which may require medical attention, are:

- Inadvertent Inoculation: A vaccinia rash or outbreak of sores limited to one area. This is an accidental spreading of the vaccinia virus caused by touching the vaccination site and then touching another part of the body or another person. It usually occurs on the genitals or face, including the eyes, where it can damage sight or lead to blindness. Washing hands with soap and water after touching the vaccine site will help prevent this inadvertent inoculation. This is the most frequent complication of smallpox vaccinations (529 per million primary vaccinees), accounting for approximately half of all complications of primary vaccination and revaccination.
- Generalized vaccinia: A widespread vaccinia rash. The virus spreads from the vaccination site through the blood. Sores break out on parts of the body away from the vaccination site. Generalized vaccinia is estimated to occur in 242 per million primary vaccinees.
- Erythema multiforme: A toxic or allergic rash in response to the vaccine that can take various forms. A variety of these rashes can occur approximately 10 days after a primary vaccination in one person per 3,700 vaccinated.

Rarely, people have had very bad reactions to the smallpox vaccine. Between 14 and 52 people per million people vaccinated for the first time have experienced potentially life-threatening reactions. These reactions, which require immediate medical attention, are:

- Eczema vaccinatum. Serious skin rashes caused by widespread infection of the skin in people with skin conditions such as eczema or atopic dermatitis. Eczema vaccinatum is estimated to occur in 10-39 per million primary vaccinees.
- Progressive vaccinia (or vaccinia necrosum). Ongoing infection of the skin with tissue destruction frequently leading to death.
- Postvaccinal encephalitis. Inflammation of the brain.

It is estimated that between 1 and 2 people out of every million people vaccinated may die as a result of these life-threatening reactions to the vaccine.

This statistical information about the adverse reactions from smallpox vaccine is based on data from two studies conducted in 1968. Adverse event rates today may be higher because there may be more people at risk from immune suppression (from cancer, cancer therapy, organ transplants, and illnesses such as HIV/AIDS) and eczema or atopic dermatitis. The outcome associated with adverse events may also be less severe than previously reported because of advances in medical care. Rates will be lower for persons previously vaccinated.

SOURCES OF DATA:

- Actuarial Note, Hartman & Associates, Senate Bill 153, March 11, 2003, original of which is on file in the General Assembly's Fiscal Research Division.
- Actuarial Note, Aon Consulting, Senate Bill 153, March 11, 2003, original of which is on file with the Comprehensive Major Medical Plan for Teachers and State Employees and the General Assembly's Fiscal Research Division.
- Smallpox Vaccine Adverse Event Rates, United States, 1968, Centers for Disease Control & Prevention, U.S. Department of Health & Human Services.
- Smallpox Vaccination and Adverse Reactions, Morbidity and Mortality Weekly Report, February 21, 2003, National Center for Infectious Diseases, Centers for Disease Control & Prevention, U. S. Department of Health & Human Services.

TECHNICAL CONSIDERATIONS: None.

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