We certainly acknowledge that a certain percentage of the population has allergic reactions to natural rubber latex and that such individuals need to be informed of products that contain latex That need must be balanced, however, against the global, public health imperative to stop the spread of HIV. In the absence of an effective HIV vaccine, the sustained usage of condoms is the most effective way to stop the spread of HIV among sexually active people Declaring latex condoms in effect hazardous substances, and having warning labels to that effect, may scare people away from using condoms. For most of these people, a latex condom is in fact harmless Unprotected sex, however, is not harmless when it leads to HIV infection.

In protecting people who are allergic to natural rubber latex, we urge the Commission not to undermine the global, public health goal of stopping the spread of HIV infection.

Sincerely,

Ronald S. Johnson

LAW OFFICES
KELLER AND HECKMAN LLP
1001 G STREET, N.W.
SUITE 500 WEST
WASHINGTON, D.C. 20001
TELEPHONE (202) 434-4100
FACSIMILE (202) 434-4646

25 RUE BLANCHE
B-1060 BRUSSELS
TELEPHONE 32(2) 541 05 70
FACSIMILE 32(2) 541 05 80

WWW.KHLAW.COM

June 21, 2000

202-434-4143
millar@khlaw.com

Sadye Dunn
Secretary
U.S. Consumer Product Safety Commission
4330 East West Highway, Rm. 502
Bethesda, MD 20814

Re: Petition HP 00-2, Petition on Natural Rubber Latex

Dear Ms. Dunn:

We are pleased to submit these comments on behalf of Bridgestone/Firestone, Inc. (hereafter "BFS"), a major manufacturer of important and useful products produced from natural rubber latex, in response to the petition to designate natural rubber as a "strong sensitizer" under the Federal Hazardous Substances Act (FHSA). BFS respectfully opposes the petition submitted by Ms. Adkins in part because it is legally insufficient on its face. The petition asks the Commission to declare natural rubber a "strong sensitizer." Petitioner requests promulgation of a rule that 1) natural rubber be subject to FHSA labeling requirements and 2) that natural rubber be considered a "banned hazardous substance" inasmuch as it is contained in toys or other article intended for children. However, the petition lacks the requisite evidence or other supplementary materials to make out even a *prima facie* case that natural rubber is a hazardous substance within the meaning of the FHSA.

Before turning to a discussion of the reasons why the petition fails to meet the legal standard set by Congress and the Commission to act on Petitioner's request, we provide below some background on the Company, and on the range of products made from natural rubber, to assist the Commission in its review.

Background

BFS is a major manufacturer of tires and other products made from natural rubber, typically using the "dry" form of natural rubber, many of which are not "household" products as that term is defined. Many other commenters have pointed out the distinctions between the dry and dipped forms of natural rubber, so we will not repeat those distinctions here. Nevertheless, it is worth noting that natural rubber, in either dry or dipped form, may be used in a vast array of household or industrial products, in varying amounts, and in varying applications, many of which may involve no potential exposures to consumers. Natural rubber is used in tires, of course, as well as in hoses, seals, and a variety of automotive and other molded rubber products. It is used, for example, in mats and other nonskid surfaces. It is used in shoes and in rubber stoppers. It is used in foam bedding, elastic, household gloves, toys, sports equipment and children's products, like nipples and pacifiers. It is used in industrial applications, like conveyor belts, coatings, adhesives, roofing materials, and asphalt. Natural rubber is also used in various medical applications subject to the jurisdiction of the federal Food and Drug Administration (FDA), like catheters and gloves. Many of these products are manufactured and sold by small businesses.

Natural rubber and products made from natural rubber provide extraordinary value to consumers. Tires, of course, are essential to a mobile society. Natural rubber car bumpers and automotive products often offer added safety. Medical products made from natural rubber offer recognized barrier protection to protect medical workers and others from blood-borne diseases like AIDS or hepatitis. Natural rubber roofing products help maintain the integrity of the roofing system, extending the useful life of the system by maintaining system integrity and water-tightness. Natural rubber elastic is used in underwear and sports and other apparel. In short, consumers are likely to encounter a variety of products made with natural rubber *every single day.*

It is also worth noting that natural rubber is a sustainably produced product. Rubber trees are a renewable resource, and grow only in certain regions of the world close to the equator. Rubber trees are an important cash crop, offering opportunities for jobs in areas of the world where few employment alternatives exist.

BFS is a strong believer in principles of sound risk assessment. Individuals need to be protected from significant hazards to which they may be exposed. In making decisions about risks, of course, government agencies must act to prioritize and to address known risks, applying accepted risk assessment principles in conformance with statutory mandates and accepted scientific standards. In this case, the FHSA establishes the standard that must be applied by the CPSC in considering this request. As we note below, the petition fails to meet the FHSA requirements so as to grant Petitioner the relief she seeks. The petition fails to establish that natural rubber is a strong sensitizer in any and all forms (dry or dipped) in which it may be present in a product, in any and all amounts, and in any and all household products subject to the CPSC's jurisdiction. The

petition certainly cannot justify what would in effect be a sweeping set of new labeling requirements, and a possible complete ban on an array of useful children's products. Such a ban could encompass not just toys, pacifiers, and the like, but also any product containing natural rubber elastic, like underwear and other clothing, or natural rubber adhesives, intended for use by children. Further, imposition of such rules would certainly require a complete evaluation under the provisions of the Small Business Regulatory Enforcement Fairness Act (SBREFA) given the large number of potentially affected products and many businesses (including small businesses) which make those products.

I. The Legal Standard

For natural rubber to be deemed a hazardous substance under the FHSA, as Petitioner requests, it must meet a two-part test. Petitioner must show, under FHSA §§ 2(f) (1)(A)(iv),(vi), 2(k), that:

1) Natural rubber is a "strong sensitizer"; and
2) Natural rubber causes substantial illness as a proximate result of its reasonably foreseeable use.

Natural rubber must satisfy this two-part threshold definition before it, or any specific household product containing it, can be considered to be "banned hazardous substances" under FHSA § 2(q)(1) or, if improperly labeled, "misbranded hazardous substances" under FHSA § 2(p). The products containing natural rubber, of course, must meet FHSA's implicit jurisdictional threshold as products "intended, or packaged in a form suitable, for use in the household or by children." FHSA §§ 2(p), 2(q)(1). Items outside the FHSA's jurisdictional scope include foods, drugs, medical devices and cosmetics subject to the Federal Food, Drug, and Cosmetic Act; industrial products; and products not otherwise intended for household use as defined by the statute (like tires, which are subject to regulation under the National Highway Transportation Safety Act (NHTSA), the Department of Transportation (DOT) and the Environmental Protection Agency (EPA)).

A. Definition of a "Strong Sensitizer"

Section 2(k) of the FHSA defines the term "strong sensitizer" as follows:

> [A] substance which will cause on normal living tissue through an allergic or photodynamic process a hypersensitivity which becomes evident on reapplication of the same substance and which is designated as such by the Secretary. Before designating any substance as a strong sensitizer, the Secretary, upon consideration of the frequency of occurrence and severity of the reaction, shall find that the substance has a significant potential for causing hypersensitivity.

FHSA regulations, in turn, both supplement the statutory definition of "strong sensitizer" and clarify particular terms within it. Under the regulations, the Commission must consider any or all of the following ten factors (where available) in determining that a substance is a strong sensitizer:

1. Quantitative or qualitative risk assessment;
2. Frequency of occurrence and range of severity of reactions in healthy or susceptible populations;
3. The result of experimental assays in animals or humans (considering dose-response factors), with human data taking precedence over animal data;
4. Other data on potency or bioavailability of sensitizers;
5. Data on reactions to a cross-reacting substance or to a chemical that metabolizes or degrades to form the same or a cross-reacting substance;
6. The threshold of human sensitivity;
7. Epidemiological studies;
8. Case histories;
9. Occupational studies; and
10. Other appropriate *in vivo* and *in vitro* test studies.

16 C.F.R. § 1500.3(c)(5)(ii).

As risk assessment methodology has evolved, it is clear that these factors must be viewed in combination as part of the overall scientific evaluation of whether a substance has a "significant potential for causing hypersensitivity." And, of course, a risk assessment is not complete unless it takes into consideration the performance, safety and other benefits of the substance or product sought to be regulated, especially where a proposal to designate an article or substance as a banned hazardous substance is at issue. FHSA § 3(h).

"Severity of reaction" in section 2(k) of the FHSA means, at a minimum, a clinically important allergic reaction. 16 C.F.R. § 1500.3(c)(5)(iii). "Significant potential for causing hypersensitivity" is a relative term. The Commission's determination may rest "upon the chemical or functional properties of the substance, documented medical evidence of allergic reactions obtained from epidemiological surveys or individual case reports, controlled *in vitro* or *in vivo* experimental assays, or susceptibility profiles in normal or allergic subjects." 16 C.F.R. § 1500.3(c)(5)(iv). While the extent to which an individual may exhibit, based on some test, a degree of possible sensitization to a substance is a factor to consider, a much more important factor is the rate of clinically observable reactions to the substance reported. It is often the case, as with natural rubber, that the actual rate of clinical response is significantly lower than the number of people who test positive for some sensitization response, as some commenters have made clear.

B. The Meaning of "Substantial Personal Injury as a Proximate Result of Any Customary or Reasonably Foreseeable Use"

FHSA regulations make clear that "substantial personal injury" means any significant injury. 16 C.F.R. § 1500.3(c)(7)(ii). "Proximate result" means a result that follows in the course of events without an unforeseeable, intervening, independent cause." 16 C.F.R. §1500.3(c)(7)(iii). By "reasonably foreseeable handling or use," the statute, as the Commission interprets it, includes "the reasonably foreseeable accidental handling, not only by the purchaser or intended user, but by all others in a household, especially children." 16 C.F.R.§ 1500.3(c)(7)(iv). The extent to which there is a clinically observable response, the severity of the actual response, and the likelihood of recovery upon removal of the exposure source, are important factors.

II. The Petition Lacks The Evidence Required to Make a *Prima Facie* Case Justifying the Proposed Rule.

Petitioner's letter suggests that because the FDA has issued a rule regarding natural rubber medical devices and because "nonmedical natural rubber gloves and other consumer products are beyond the FDA's jurisdiction," it automatically follows that the Commission should promulgate the rule she proposes. Petitioner's Letter, ¶3. The petition itself, however, provides no evidence as to why the FDA's rulemaking on natural rubber should serve as a proxy for a similar CPSC rulemaking regarding these "other consumer products." The petition fails to demonstrate why these products qualify as strong sensitizers under the FHSA that should be labeled or banned.

Petitioner provides the front page of one medical journal article. The article estimates that two percent of the general U.S. population has a sensitivity to natural rubber, although it is not at all clear of this, what percent experience clinical symptoms. The article shows that rubber latex allergy has affected certain occupational or surgically affected groups of persons — health care workers, rubber industry workers, and persons who have undergone multiple surgeries, particularly those with spina bifida. These groups' exposure to natural rubber occurs through product outside the household, however; namely, medical devices or products and industrial products. CPSC lacks jurisdiction under the FHSA to issue a rule with regard to natural rubber applicable to such products.

The article does provide a list of some 19 household products or product categories that contain natural rubber in either dry or dipped form, and it mentions in passing that anaphylaxis has occurred, presumably as a result of contact with three of those products. However, neither the article nor Petitioner provides any further information about the number of persons who suffered latex allergy reactions in those cases, the medical or occupational background of those persons, or whether they had special risk factors. If one puts to one side the tiny minority of persons who previously

have been occupationally or surgically exposed and sensitized to natural rubber — situations already addressed or being addressed by the FDA and OSHA — the article certainly does not suggest that serious allergic reactions to natural rubber in household products are a common phenomenon or, indeed, a phenomenon of such frequency in susceptible or healthy populations so as to justify designation as a "strong sensitizer" under the FHSA.

Also included in Ms. Adkins' petition are 11 incident reports. Two appear to involve the same person, a 57-year-old female from South Dakota. Her occupational and medical histories are not provided. She apparently is sensitive to latex balloons and food worker gloves. Three reports come from the same 34 year-old female from New Hartford, Connecticut. Her occupational and medical histories are not provided either. She has apparently suffered allergic reactions to balloons, carpet runners, and her husband's work boots. Thus, the petition actually provides documentation from or about eight persons in total who contend that they suffer from allergic reactions to natural rubber.

Three of the remaining six complainants are identified as nurses who acquired their sensitivity from on-the-job exposure to medical devices containing natural rubber, including surgical gloves. One, Lt. Harold Henderson, who died in 1997, was a trauma nurse in the U S. Navy with intense work experience in the emergency room and intensive care units.

Two reports involve children. "Adam" from Pittsburgh is a six-year-old child whose anaphylaxis once manifested itself at the age of three ostensibly as a result of latex gloves used in a restaurant. The report says nothing on how Adam was sensitized and gives no other details on his medical or environmental background. Denise Odenbreit was a 13 year-old girl who died, tragically, after she went into anaphylactic shock after blowing up a balloon. It is probable that Denise, with a family history of allergies to begin with, apparently became sensitized to latex during a prior hospital stay for asthma when she blew up surgical gloves for fun.

Finally, a 50 year-old woman reports she allegedly suffers severe eczema ostensibly as a result of natural rubber in undergarments. No medical or occupational history was provided.

In short, the petition provides one medical journal article that shows that natural rubber sensitivity is restricted to very narrow occupation or other groups and eight reports extremely thin in the kind of scientific detail mandated by the FHSA. The petition provides no other data, however, about the frequency of allergic reactions arising from exposure to household products containing natural rubber; no data about the threshold of exposure required to develop natural rubber sensitivity, including data on duration of contact, the amount of natural rubber protein concentration, and the mode of exposure; no data about the bioavailability or potency of natural rubber in such household products; no

true individual case histories; and no qualitative or quantitative risk assessment showing that exposure to household products containing natural rubber has a "significant potential for causing hypersensitivity." The petition makes no showing that natural rubber in such products, regardless of the amount of natural rubber contained in the product and without regard to natural rubber protein bioavailability, causes illness as a direct result of customary or foreseeable handling of such products. Indeed, the Petitioner has submitted information for the record noting that some products are made using additional chemicals which may be implicated in some reported allergic responses.

Information submitted by other commenters point to the fact that the more severe allergic reactions to natural rubber primarily occur with exposures associated with some sort of health care situation, often involving subcutaneous exposures. BFS is a member of the Rubber Manufacturers Association (RMA), and supports the comments they submitted, particularly regarding the absence of allergic responses in worker population. It is noteworthy that BMS itself has, in its entire 100-year history of operations, received very few complaints from its workers about adverse reactions to natural rubber in the course of their work for the Company, and the majority of those complaints have been determined to result from exposure to something other than natural rubber. Further, in the past seven years, the Company has had no such complaints.

III. Conclusion

The substances currently listed as "strong sensitizers" were so designated by a department that previously administered the FHSA, the Department of Health, Education, and Welfare (HEW). HEW not only evaluated the available scientific information to assess whether the substance qualified as a "strong sensitizer," but also considered the amounts of the substances in question that may be contained in household products as part of the designation process. This is based on HEW's obvious recognition of the fact that toxicity – in this case, a type of allergic reaction – is inextricably tied to exposure. Risk assessment thinking about possible allergens has evolved even further since then. Increasingly, not only is the amount of a substance present in a consumer product an issue to consider, but more importantly, whether any of the material, and if so, how much, is bioavailable so as to cause the complained-of reaction.

The evidence is lacking to suggest that significant numbers of consumers are suffering clinically significant reactions to natural rubber in household products. Petitioner, however, requests that all forms of natural rubber, in all household products, in any and all amounts, be designated as a strong sensitizer, and that all toys or other children's products containing natural rubber be designated as "banned hazardous substances."[1]

---

[1]As an aside, we note that if the Commission were somehow to act favorably on the petition and promulgate the sweeping, unsupported rule requested, one sure result would be a torrent of exemption requests under 16 C.F.R. § 1500.82.

We do not believe, therefore, that Petitioner has provided sufficient, specific evidence to show that natural rubber meets either definitional prong of a "hazardous substance" under FHSA § 2(f), much less to justify the broad rule that Petitioner proposes. The petition simply fails, as required, to "set forth facts which establish the claim that the issuance of . . . the rule [she requests] is necessary." 16 C.F.R. § 1051.5(a)(4).

Respectfully submitted,

Sheila A. Millar
Eric H. Singer
Counsel for Bridgestone/Firestone

71

Allegiance Healthcare Corporation
1430 Waukegan Road
McGaw Park Illinois 60085-6787
847-689-8410

June 21, 2000

VIA FEDERAL EXPRESS

Office of the Secretary
Consumer Product Safety Commission
Room 502
4330 East-West Highway
Bethesda, MD 20814

Re: Petition HP 00-2, Petition on Natural Rubber Latex

Dear Madam Secretary:

Allegiance Healthcare Corporation ("Allegiance") is pleased to have the opportunity to submit these comments to the Consumer Product Safety Commission ("CPSC"). For the reasons set forth below, Allegiance urges the CPSC to deny the petition submitted by Debra Adkins on January 18, 2000 ("Petition"), requesting that the CPSC issue a rule declaring that natural rubber latex ("NRL"), and products containing NRL, are "strong sensitizers" within the meaning of the Federal Hazardous Substances Act ("HSA").[1]

Allegiance takes very seriously the reality of latex allergy. However, we oppose the Petition to declare NRL a strong sensitizer or "hazardous substance" because NRL does not meet the statutory requirements necessary to classify it as either one. The scientific evidence is clear that very few people in the general population are adversely affected by NRL despite the fact that NRL has long been ubiquitous in daily life. For those few who react to NRL at all, most reactions are mild and manageable and do not result in "substantial injury or illness" as defined by the HSA. Moreover, granting the petition carries the potential to stigmatize NRL in its many medical and public health uses where its unique high-quality barrier properties are among the

[1]The relief sought in the Petition is somewhat unclear. We construe the Petition as requesting a rule declaring NRL a "hazardous substance" and "banned hazardous substance," as defined in the HSA.

most valuable and effective protections against the spread of potentially deadly bloodborne diseases.

I. INTRODUCTION

From underwear to pacifiers, from condoms to shoes, it is estimated that as many as 40,000 types of consumer products may contain NRL. Given the omnipresence of NRL, the Petition asks the CPSC to promulgate a regulation that will reach into every nook and cranny of American life. Allegiance recognizes that some people -- a small portion of the population -- are allergic to NRL. Most people have no allergy to NRL. Even for those who may have an NRL allergy, the vast majority of these individuals will experience mild hay fever-like symptoms or a mild skin rash Only in the rarest circumstances will an individual experience a more severe reaction.

The Petition's effect threatens to be drastic and far-reaching. Essentially, the Petition asks the CPSC to declare NRL a "hazardous substance." Under the HSA, this potentially could *ban* most or all NRL-containing consumer products intended for use by children. Such a finding would limit the availability of pacifiers, diapers, baby bottles, and other essential consumer products. Granting the Petition could mean that only non-NRL children's products could be sold. The CPSC should not grant this petition; even if it does, the economic impact to consumers from this restriction of choice should be quantified. A ban that may affect many thousands of consumer products would be costly and unnecessary, given how few people suffer adverse effects.

II. ALLEGIANCE

Allegiance manufactures or distributes over 300,000 medical, surgical, and laboratory products to hospitals and other healthcare providers. Some of these products contain NRL. Because of the potential for allergic and non-allergic reactions to NRL gloves, Allegiance has been a leader in a national educational campaign on NRL allergy and has designed public service educational activities to address NRL allergy management and healthcare worker safety, including seminars and educational video-tapes. We have sponsored education and training programs for healthcare workers. We have held hundreds of seminars for hospitals and healthcare workers across the United States and abroad, and we offer a continuing education

video series on NRL sensitivity. We offer a glove management program that helps hospitals choose the right glove for the right purpose and provide clinical counseling by registered nurses. This program facilitates the identification of different reactions that glove users or patients may experience.

Allegiance has also cooperated with federal authorities, including the U S. Food and Drug Administration ("FDA"), to develop scientifically sound technology and standards that will minimize potential reactions to NRL. Allegiance supports the FDA's labeling requirements for latex-containing medical devices, and we were one of the first companies to begin labeling latex containing medical devices, before the FDA made such labeling mandatory [2] We share the laudable goal of minimizing allergic reactions to NRL, but the Petition would stigmatize NRL without scientific or medical justification.

III. NRL MANUFACTURING PROCESS

The Petition pertains to a product that occurs naturally and has been used to greatly benefit the public for many decades. NRL comes from rubber trees (*Hevea brasiliensis*). Rubber trees are typically grown on rubber plantations that contain thousands of trees. Rubber is tapped from the trees in a manner similar to how maple syrup is tapped - the tree produces raw latex and the raw latex is gathered in cups strapped to the rubber tree. Rainfall amounts, seasons, temperature, and soil composition all affect the latex produced by the rubber trees. After the raw latex is collected from the rubber tree, it is centrifuged and ammoniated.

The manufacturing process for NRL products differs according to the product. In the case of NRL gloves, the ammoniated latex is delivered to the manufacturing facility, where it is mixed with additional ingredients to stabilize the latex. Latex glove manufacturing lines contain hand-shaped glove formers (sometimes called molds). The formers are typically made of porcelain. The glove formers move along the manufacturing line and are dipped, leached and rinsed for precise periods of time in stainless steel tanks containing cleaning solutions, coagulants,[3] latex compound, water and slurries (which apply powder and silicone to make

[2] 21 C.F.R. §801.437 (1999).

[3] Coagulant ("coag") is a solution generally comprised of salts and either water or alcohol as the carrier and calcium carbonate as a form release agent. The purpose of coagulant is to break

gloves easier to put on and take off). Next, the formers are heated in ovens for a precise period of time at specific temperatures. These ovens cure the latex on the formers and allow the gloves to form.

After the latex gloves have been cured, the gloves, still on the formers, are leached and rinsed in water tanks. This crucial step reduces the amount of latex proteins and allergens in the gloves. Because proteins and allergens rise to the surface of the gloves as a result of the curing process, many of them can be removed by leaching or rinsing the gloves for controlled periods in temperature-controlled water. However, not all proteins can be removed because they stabilize the latex and prevent the premature coagulation of the rubber particles, thereby providing a significant benefit in the manufacture of latex gloves. By preventing premature coagulation, the latex can be applied to the glove formers in a smooth, uniform manner, which decreases the likelihood of pinholes and insures that the gloves provide maximum barrier protection.

After leaching and rinsing, the gloves enter a cooling oven for drying. Non-powdered gloves are then "blown down" from the formers with high-pressure air and stripped from the formers. Powdered gloves remain on the formers while they are dipped in a liquid powder mix and then blown down and stripped. This process, in addition to removing the glove from the former, inverts the glove putting the powdered surface on the inside Certain non-powdered gloves are then sent off-line for chlorination. Once these processes have been completed, the gloves are sent for packaging, sterilization and marketing.

IV. REGULATION OF NRL BY OTHER AGENCIES

Over the past decade several governmental bodies have addressed the NRL issue, including the National Institute of Occupational Safety and Health (NIOSH), The Centers for Disease Control and Prevention (CDC), and the Occupational Safety Health Administration (OSHA). All of these agencies have issued recommendations to educate and reduce the risk of latex allergies. However, the FDA has been most active in this area. NRL medical gloves are a "medical device" under the Federal Food, Drug and Cosmetic Act of 1990 and are subject to FDA regulation. [4] Since 1998, the FDA has required labeling statements on medical devices

---

down the electrical forces holding the rubber particles in suspension in the latex so gloves can be formed.

[4] 21 U.S.C. §301, *et seq.* (1999).

containing NRL that contact humans, including device packaging.[5] In addition, on July 30, 1999, the FDA published a proposed rule applicable to surgeon's and patient examination gloves which, among other things, would establish recommended maximum powder and protein levels for surgeon's and patient examination gloves.[6] The FDA has also published a related 250 page draft "Medical Glove Guidance Manual," which gives a technical explanation of the methods for manufacturers to use to comply with the new regulations.[7]

The FDA requires content labeling to inform users that medical devices or their packaging contains NRL, but the agency was careful not to create fear that NRL was in any way hazardous. In its 1997 final rule, the FDA stated, "[t]he benefits of devices that contain natural rubber are well established, and the agency does not intend to discourage their use by persons who are not sensitive to natural rubber. Therefore, the agency will not require the labeling statement to recommend the use of rubber-free devices."[8]

V. SENSITIZATION vs. ALLERGIC REACTION

There is a very important distinction between sensitization and allergic reaction, and this distinction should be kept in mind throughout the present analysis. Many sources mistakenly use the terms *sensitization* and *latex allergy* interchangeably, which is inaccurate and confusing The following is a brief overview of the distinctions between the two terms.

A. Sensitization

Dr. Charles E. Reed, Emeritus Professor of Medicine, Mayo Medical School, recently informed members of Congress that "[t]he mere presence of IgE antibody to rubber allergens does not mean disease."[9] Dr. Reed further stated that "[m]any healthcare workers with IgE

---

[5] Natural Rubber-Containing Medical Devices; User Labeling, 62 Fed. Reg. 51,021 (1997).

[6] Surgeon's and Patient Examination Gloves, 64 Fed. Reg. 41,710 (1999) (to be codified at 21 C.F.R. pts. 801, 878, 880) (proposed July 30, 1999).

[7] Food and Drug Administration, Medical Glove Guidance Manual (Draft released for comment on July 30, 1999).

[8] 62 Fed. Reg. at 51,026.

[9] *Do OSHA's Actions Confuse or Clarify: Hearing on Latex Allergies and the Healthcare Industry Before the Subcommittee on Oversight and Investigations of the House Committee on Education and the Workforce,* 106th Cong. at 2 (1999) (statement of Dr. Charles Reed, M.D.).

antibody do not have disease upon exposure."[10] Similarly, the "Annals of Allergy, Asthma & Immunology" recently published a study by several well-respected scientists who reported that "many and often the majority of subjects with IgE to a given allergen may not manifest clinical reactivity."[11] The number of people sensitized to NRL allergens is much higher than the number of people who actually experience allergic reactions. The term *sensitization* refers to the presence of IgE antibody in response to a particular antigen. The mere presence of the IgE antibody in an individual does not mean that individual will ever experience an allergic reaction to NRL. (See Appendix) (Sec. I). Therefore, equating latex sensitization with actual latex allergic reactions overstates the prevalence of allergic reactions because many sensitized individuals do not react when exposed to latex.

B. Allergic Reactions

It is important to understand not only what latex allergy is, but also what it is not. It is not sensitization. It is not contact irritant dermatitis. And it is not a Type IV reaction. As previously stated, NRL allergy is in fact no different than any other common allergy. There are three main types of reactions to NRL-containing products: irritant contact dermatitis; allergic contact dermatitis; and immediate hypersensitivity.[12] Irritant contact dermatitis is *not* an allergic reaction (*i e.*, is not an immune-mediated reaction). Allergic contact dermatitis, otherwise referred to as chemical allergy, or Type IV delayed sensitivity, is *not* an allergic reaction to NRL Rather, it is a reaction to the chemicals that may be contained in the product, *i e.*, accelerators, preservatives, colorants, or other additives. Irritant and allergic contact dermatitis are much more common reactions to NRL than a Type I reaction, discussed below. Allergic contact dermatitis is diagnosed by skin patch testing.

Finally, immediate hypersensitivity, also referred to as Type I, IgE-mediated reaction, is the only true allergic reaction to NRL. Type I hypersensitivity reactions may manifest as urticaria, asthma, allergic rhinoconjunctivitis, and rarely, anaphylaxis. Many people who think

---

[10] *Id.*

[11] A. Saxon, et al., *Prevalence of IgE to Natural Rubber Latex in Unselected Blood Donors and Performance Characteristics of AlaSTAT Testing,* 84 Annals of Allergy, Asthma and Immunology 199, 203 (2000) (Research supported by Allegiance).

[12] See Saxon, *supra*, at 203.

they are "latex allergic" are actually experiencing dermatitis or Type IV reactions, which are not true NRL allergies. Atopy (history of allergic rhinitis, asthma, or atopic dermatitis) is a risk factor for developing NRL allergy, as is allergy to cross-reacting foods, such as banana, kiwi, avocado, and chestnut.[13]

Individuals who are allergic to NRL react to allergens found in NRL. These allergens are proteins contained in NRL, but not all proteins are allergens. In reality, a very small number of individuals will ever have a Type I, immediate IgE-mediated response to natural rubber. Most people who do have such a response will have symptoms no more severe than those associated with hay fever.

Petitioner attached Consumer Product Incident Reports that reported individuals experiencing anaphylactic symptoms from being in a room with NRL balloons. A serious reaction of that kind typically cannot be triggered by mere inhalation exposure. In fact, anaphylaxis occurs primarily in patients during surgery or medical examinations, when the allergen is introduced into the blood circulation through injection, absorption through serous surfaces or the gastrointestinal mucosa.[14] Therefore, more severe reactions to NRL will not result from "customary or reasonably foreseeable handling or use," of an NRL-containing consumer product as defined by the HSA.[15]

VI. FEDERAL HAZARDOUS SUBSTANCES ACT

The standard the FDA uses for determining whether a medical device warrants cautionary labeling is much different than the criteria enumerated in the HSA for consumer products The fact is that NRL is neither a hazardous substance nor a strong sensitizer, and regulation of NRL-containing products by the CPSC therefore would be inappropriate.

In effect, the Petition asks the CPSC to make a finding that NRL is a "hazardous substance." This classification requires a showing that:

---

[13] NIOSH Alert, "Preventing Allergic Reactions to Natural Rubber Latex in the Workplace" at 4 (1997).

[14] Reed, *supra,* at 3.

[15] 15 U.S.C. §1261(f) (1999).

(1) the product is toxic; corrosive; an irritant; a strong sensitizer;[16] flammable or combustible; or generates pressure through decomposition, heat or other means; and

(2) the product can cause "substantial personal injury or substantial illness" during or resulting from customary or reasonably foreseeable handling or use.[17]

A. NRL is not a Strong Sensitizer

For the reasons detailed below, NRL is not a "strong sensitizer" as defined by the HSA. All studies agree that the overwhelming majority of the population is not even sensitized to NRL. Most of the small number who are sensitized will never have any actual allergic reaction to NRL. For those few who do have true allergic reactions, the reactions are usually mild, moderate, and manageable.

The HSA defines a "strong sensitizer" as a substance that causes hypersensitivity[18] "on normal living tissue through an allergic or photodynamic process," which hypersensitivity becomes evident on reapplication.[19] In assessing whether a sensitizer -- *i e*, a substance that may (or can) induce an allergic response -- is "strong," the CPSC must consider "quantitative or qualitative risk assessment, frequency of occurrence and range of severity of reactions in healthy or susceptible populations, the result of experimental assays in animals or humans and the potency or bioavailability of sensitizers, . . ."[20] This statutory definition of "strong sensitizer" is much different than the medical literature's definition of "sensitization" as discussed in Section V above. The two cannot be equated.

Other factors to be considered include data on reactions to a cross-reacting substance or to a chemical that metabolizes or degrades to form the same or a cross-reacting substance, the threshold of human sensitivity, epidemiological studies, case histories, occupational studies, and

---

[16] 15 U.S.C. § 1261(k).

[17] 15 U.S.C. § 1261(f)(1)(A).

[18] To determine whether a substance causes "hypersensitivity," the CPSC will, on a case-by-case basis, consider factors such as the substance's chemical or functional properties, documented medical evidence of allergic reactions, and/or susceptibility profiles. See 16 C.F.R. § 1500.3(c)(5)(iv) (2000).

[19] 15 U.S.C. § 1261(k).

[20] 16 C.F.R. § 1500.3(c)(5)(ii).

other appropriate *in vivo* and *in vitro* test studies.[21] Moreover, for a substance to be a strong sensitizer, it must cause a "clinically important allergic reaction."[22]

Although the legislative history on the HSA is sparse, Congress clarified that the definition of hazardous substances under the HSA was not intended to include substances where the hazard is minor when comparing the risk or chance of injury to the degree of injury that is probable or possible. [23] Furthermore, Congress, in enacting the HSA, intended to require precautionary labeling, "which is meaningful and will be observed by the user, but not to require labeling on so many of the things that go into a household as to invite carelessness and the ignoring of precautionary statements on substances which present substantial hazards."[24]

If the CPSC were to declare NRL a hazardous substance, labeling would be required on consumer products within CPSC's jurisdiction. An average household uses hundreds or thousands of NRL-containing consumer products that would either be banned or require labeling, for example, rubber bands, carpeting, bicycle handgrips, swimming goggles, racquet handles, shoe soles, expandable fabric on waistbands, dishwashing gloves, hot water bottles, balloons, pacifiers, baby bottle nipples, pacifiers, masking tape, and numerous adhesives Consumers use these household items on a daily basis and would be tempted to ignore a ubiquitous warning label, thereby inviting precisely the carelessness and dismissal of precautionary statements that Congress intended to prevent.

1. Codified Strong Sensitizers

In 1961, only five substances were codified as strong sensitizers as part of HSA's implementing regulations: (1) paraphenylenediamine (and products containing it), (2) powdered orris root (and products containing it); (3) certain epoxy resin systems; (4) formaldehyde (and products containing 1% or more of formaldehyde); and (5) oil of bergamot (and products

---

[21] *Id.*

[22] 16 C.F.R. § 1500.3(5)(iii).

[23] S.Rep. No. 1158, at 11 (1960).

[24] *Id.*

containing 2% or more of oil of bergamot).[25] In the forty years since, neither the FDA nor the CPSC has declared any other substance "a strong sensitizer."

NRL is clearly distinguishable from all five substances listed as strong sensitizers. Three of the five substances listed (paraphenylenediamine, certain epoxy resin systems, and formaldehyde) are toxic chemicals that are listed as sensitizers under the heading "acute health hazards" in The Sigma-Aldrich Library of Regulatory and Safety Data.

Oil of bergamot and powdered orris root are both botanicals used in perfumes and cosmetics. Oil of bergamot is a photosensitizer, not an allergen, which magnifies the effects of ultraviolet light on the skin. Powdered orris root, mostly found in cosmetics, was regarded as an important cause of allergic symptoms. Little information can be found on this substance, as cosmetic manufacturers virtually discontinued its use due to its extreme allergenicity. NRL is clearly distinguishable from powdered orris root because NRL is ubiquitous and harmless to the vast majority of consumers. Moreover, unlike orris root, it would be virtually impossible, from a practical standpoint, to eliminate natural rubber from the production of all consumer products.

2. **1973 CPSC Advisory Opinion**

In 1973, the Chairman of the CPSC issued an Advisory Opinion declaring that permanent press clothing was not a strong sensitizer. [26] In this Advisory Opinion, the CPSC held that a strong sensitizer is a substance that affects a *significant portion of the population* and which may cause a *severe adverse reaction.*[27] The current Petition does not provide any scientific evidence that NRL affects a significant portion of the population because such scientific evidence does not exist. In fact, the petitioner indicates that "the prevalence of latex [allergy] in the general population is probably less than 2%." Furthermore, the Petition does not contain any scientific data suggesting that NRL-containing consumer products may cause a severe reaction.[28] Again, this is because such scientific findings do not exist.

---

[25] 16 C.F.R. §1500.13 (2000).

[26] CPSC Advisory Op. No. 12 (July 26, 1973).

[27] *Id.*

[28] Petitioner has attached a death certificate of Denise Rae Odenbreit to her petition, which lists anoxic encephalopathy, respiratory arrest, and probable status asthmaticus, not latex allergy, as the causes of death. Furthermore, Petitioner references the death of Sherry Fee Swineburg, but concedes "there was no scientific evidence to link this event to latex allergy." Additionally,

3. Discussion of Strong Sensitizer Criteria

Natural rubber latex allergy affects only a small percentage of the general population. To experience an allergic reaction to natural rubber, a person must first be sensitive to natural rubber, *i.e*, produce IgE antibodies specific to the antigens presented by natural rubber. Studies have repeatedly demonstrated that only a very small percentage of the population is even capable of producing IgE antibodies specific to natural rubber. (See Appendix) (Sec. II). The rate of sensitization to natural rubber proteins is significantly less than the rates of sensitization to other common allergens such as bee venom, pollen, or penicillin. (See Appendix) (Sec. III).

Indeed, the Petitioner concedes that the prevalence of latex allergy is only 2%, a percentage considerably smaller than those reported for natural rubber sensitization. These results indicate that NRL is not a "strong sensitizer."

The following specifically addresses the most important factors enumerated by the HSA to determine whether a substance is a "strong sensitizer." Scientific support and analysis is provided in the Appendix.

a. Risk assessment, quantitative or qualitative

NRL sensitization (not allergy) rates in the general population have been found by different studies to range between 4% and 8.8%.[29] According to Petitioner, "the prevalence of latex [allergy] in the general population is probably less than 2%."[30] While Allegiance does not believe data exist to establish the prevalence of latex allergy that high, even assuming that number is accurate, NRL allergy would clearly not be a significant enough risk to the population to warrant classification as a "strong sensitizer".

Petitioner included a Consumer Product Incident Report related to Hal Henderson. However, petitioner did not include the death certificate of Mr. Henderson, which lists the immediate cause of death as cardiopulmonary arrest due to cerebral edema, anoxic encephalopathy, and right ventricular infarction. The death certificate cites to latex allergy as one of the other significant conditions contributing to death, but "not related to the cause given."

[29] T.G. Merrett, et al., "*The prevalence of immunoglobulin E antibodies to the proteins of rubber (Hevea brasiliensis) latex and grass (Phleum pratense) pollen in sera of British blood donors*", 29 Clinical and Experimental Allergy, 1572-1578 (1999); A. Saxon, *supra,* at 203-204.

[30] Petitioner is unclear in her statement. It appears that she is referring to latex allergy, but discusses prevalence of latex allergy and rates of sensitization in the same paragraph.

b. Frequency of occurrence

Serious latex allergic reactions occur very infrequently. It appears that the CPSC has only received approximately 73 incident reports related to allergic reactions to NRL-containing consumer products over a 20 year period. This averages out to less than 4 consumer reports per year. Considering the ubiquity of NRL-containing consumer products, the frequency of occurrence is *de minimis*.

c. Range of severity of reactions in healthy and susceptible populations

The vast majority of healthy persons will have no reaction at all to NRL. As described further in Section VIII (B), irritant contact dermatitis and chemical allergy (Type IV) also known as allergic contact dermatitis, comprise the majority of reactions to NRL containing products. Both are temporary, usually mild, and manageable. Allergic reactions in healthy populations are very infrequent and mild. The susceptible population is that with atopy. Even in latex allergic, atopic individuals, reactions are usually mild and consist of hay fever-like symptoms. Anaphylaxis is rare.

d. Potency or bioavailability of sensitizers

Researchers have not yet been able to determine the minimum level of exposure that triggers allergy in allergic individuals. Researchers have, however, established with a high degree of confidence that the rare and most severe of allergic reactions, anaphylaxis, occurs primarily when allergen is introduced into the blood circulation through injection, absorption through serous surfaces or the gastrointestinal mucosa.[31]

e. Reactions to cross–reactive substances

Several studies confirm that those allergic to NRL have the propensity to cross-react to a variety of common substances, such as foods including banana, kiwi, avocado, and chestnut.[32]

f. Threshold of human sensitivity

See Potency and Bioavailability of sensitizers, Section VI (A)(3)(d).

---

[31] Reed, *supra*, at 3.

[32] Elena H. Page and Eric J. Esswein, National Institute for Occupational Safety and Health, HETA, 98-0096-2737, p.2, Exempla St. Joseph Hospital, Denver, Colorado (1999).

g. **Occupational studies**

There have been a number of occupational studies of NRL allergy with particular focus on healthcare workers' exposure to NRL through medical gloves. Some of the most important of these studies are summarized in the Appendix, Part II. These studies repeatedly demonstrate that healthcare workers, many of whom are occupationally exposed to latex gloves, show no greater prevalence of NRL sensitization than other populations.

When reviewing occupational studies, it is important to consider data concerning workers' compensation claims among healthcare workers for NRL allergy, detailed in the Appendix, Part IV. Several recent studies indicate that the rate of these claims is very low (less than 0.796 per 10,000 workers in one study, less than 1.2 per 10,000 workers in another) and that the costs engendered by NRL allergy claims is very low (in one study approximately $0.12 per employed healthcare worker per year).

Researchers from the University of Minnesota (Horwitz and McCall 2000) reviewed data from the 1983 – 1996 National Health Interview Surveys ("NHIS") to determine whether increased use and contact with NRL results in higher allergic reactivity rates. Health care workers were examined for a period of four years prior to and nine years following the CDC's implementation of Universal Precautions (which subsequently resulted in a ten-fold increase of NRL glove use among healthcare workers), and compared with individuals employed in non-healthcare settings during this same time period. There was no statistical evidence found that individuals employed in medical occupations had a higher prevalence of NRL allergic symptoms than those in non-healthcare occupations in spite of the over 1,000% increase in use of NRL gloves post-Universal Precautions. These data strongly suggest that increased use of NRL products does not lead to an increase in NRL allergic reactions.

B. **Substantial injury or illness**

To be a strong sensitizer, a substance must cause "substantial personal injury or substantial illness" during or resulting from customary or reasonably foreseeable handling or use.[33] The term "substantial" injury or "substantial" illness means any injury or illness of a

[33] 15 U.S.C. § 1261(f) (1999).

significant nature, but does not include injuries or illnesses that are wholly insignificant or negligible.[34] NRL products do not meet the criteria to be a strong sensitizer.

1. Severity of Allergic Reactions

The Petitioner has not pointed to any studies demonstrating that allergic reactions to natural rubber proteins are more severe or qualitatively any different than those reactions experienced from other common allergens, none of which are deemed "hazardous substances " Furthermore, based on Consumer Incident Reports received by the CPSC from 1980 to the present, there were only 151 total complaints that appeared to be related to consumer products containing latex (this excludes paint and medical products such as gloves.)[35] Of these 151 complaints, 73 (48.3%) cited allergic reaction due to latex. Of the 151, two (1.3%) alleged fatality due to latex reaction and two (1.3%) alleged anaphylaxis. These totals for almost 20 years of consumer incident reports strongly indicate that reactions to NRL-containing consumer products among the American public are not "severe" as described in the HSA, averaging less than four such reported reactions per year.

2. Incidence of Injury or Illness caused by NRL is Extremely Low

NRL gloves have been studied extensively with respect to NRL allergy. The extremely low incidence of problems associated with NRL gloves serves as an accurate, indeed conservative, barometer to other NRL products.

The FDA's Center for Devices and Radiological Health ("CDRH") maintains two databases to track mandatory and voluntary reports of adverse events involving medical devices, including NRL gloves. Between 1988 and 1997, the FDA received only approximately 1,550 reports of adverse events involving NRL gloves. That figure is tiny in comparison to the approximately 125 billion medical gloves that were imported into the U.S. during that period. Furthermore, the 1,550 reports filed are not limited to adverse events related to true Type I allergic reactions.[36]

---

[34] 16 C.F.R. § 1500.3(c)(7)(ii).

[35] There were several cases reported pertaining to latex paint, which does not contain NRL and 4 cases that were completely unrelated to NRL-containing consumer products.

[36] Food and Drug Administration, *Medical Glove Powder Report* (1997).

As previously discussed, workers' compensation data from several states overwhelmingly suggest that NRL allergy is not a prevalent nor significant source of injury or illness and requires minimal if any recovery time and minimal costs for treatment. (See Appendix) (Sec. IV). Furthermore, NRL allergy claims are nominal when compared with other workplace injuries.

VII. PUBLIC HEALTH BENEFITS OF NRL

Ironically, the pending petition could result in an unintended substantial injury to the American public. If the Commission were to regulate in the manner petitioner has requested, the result could be an outright ban on most NRL–containing consumer products intended for use by children, including balloons, bicycle tires, pacifiers, diapers and most shoes. Products not banned would require an alarming warning statement. This could cause people to avoid using latex condoms or gloves as well as a host of everyday, utilitarian products. The CPSC should seriously consider these effects in its analysis of the Petition.

NRL is a crucial public health bulwark against the spread of deadly infectious diseases such as AIDS, and Hepatitis B and C. Through education, the public can manage latex allergies, just like other allergies. But declaring NRL a hazardous substance would undermine almost 20 years of effort by public and private sector groups to educate the public on the critical importance of barrier protection necessary to protect the public health.

Particularly with respect to a substance such as NRL, which is an essential material in the fight against AIDS and other deadly bloodborne diseases, the CPSC must be careful to base its findings on sound scientific evidence. Recent history is filled with health scares based on unfounded, questionable, hypothetical or nonexistent science. We do not need to add NRL to the list of products that were threatened with marketplace extinction following an unfounded health scare.

VIII. ALLEGIANCE'S REQUEST TO DENY THE PETITION

In light of the above, Allegiance urges the CPSC to deny Debra Adkins' petition.

Sincerely,

Ethan E. Trail

Appendix

I. Sensitization vs. Allergic Reaction

1) "Indeed, many and often the majority of subjects with IgE to a given allergen may not manifest clinical reactivity, but that does not mean the tests are not a valid measure of IgE to the allergen in question."[37]

2) A study conducted by NIOSH recognized, "it is common to be sensitized to a substance but not have clinical symptoms of allergy."[38]

3) *Allergic disease* results from the interaction of three independent variables: (1) the amount of IgE antibody on mast cells; (2) the amount of allergen in the tissue; and (3) the degree of the body's response to the mediators released from mast cells by the binding of allergen to antibody.[39] Many individuals with IgE antibody do not have allergic disease upon exposure.[40]

II. Prevalence Studies

1) In a 1995 study, Dr. Dennis R. Ownby, formerly of the Henry Ford Hospital in Michigan, measured the prevalence of healthy adults who are capable of producing IgE antibodies specific to natural rubber antigens. Blood samples from 1,000 volunteer Red Cross blood donors were measured for anti-latex IgE antibodies.[41] The study found 6.4% of the blood samples were confirmed as repeatedly positive for anti-latex IgE. It is important to remember that a 6.4% rate of sensitization in the general public does not mean that 6.4% of the public will experience allergic reactions.

2) Similarly, in a 1999 study, 1,997 consecutive blood samples were obtained from the Oklahoma Blood Institute from adult blood donors. These samples, representing the general population, were assayed independently in three laboratories for IgE to NRL using the FDA-approved AlaSTAT ELISA for IgE to NRL.[42] The prevalence of NRL *sensitivity* in the samples

---

[37] Saxon, *supra,* at 203.

[38] Elena H. Page and Eric J. Esswein, National Institute for Occupational Safety and Health, HETA, 98-0096-2737, p. 1, Exempla St. Joseph Hospital, Denver, Colorado (1999).

[39] Reed, *supra,* at 2.

[40] R. Douglas et al., *Prevalence of IgE-mediated Allergy to Latex in Hospital Nursing Staff.* Australian & New Zealand Journal of Medicine 165-169 (1997).

[41] D. Ownby et al., *The prevalence of anti-latex IgE antibodies in 1000 volunteer blood donors,* 97 J. of Allergy and Clinical Immunology, 1188-1192 (1996); (the antibodies were measured using the AlaSTAT assay. Positive samples were also measured with the Pharmacia CAP assay.)

[42] Saxon, *supra,* at 199.

NRL gloves post-Universal Precautions. These data strongly suggest that increased use of NRL products does not lead to an increase in NRL allergic reactions.

III. NRL Compared to Other Common Allergens

1) The rate of sensitization to natural rubber proteins is in many instances significantly less than the rates of sensitization to other common allergens, such as bee venom, pollen, or penicillin.[45]

2) For example, a recent study of approximately 7,000 subjects indicated that only 4% to 7.4% of that population was sensitized to natural rubber proteins. Within that same population, 19.6% to 28.5% were found to be sensitized to grass.[46] Thus, according to that study, grass pollen sensitizes at a considerably higher rate than natural rubber.

IV. Workers Compensation Data

1) Researchers at the University of Minnesota analyzed workers' compensation data provided by the Rhode Island Department of Labor and Training's Injured Worker Services Division. It was found that during the 8 year period (1992 – 1999) examined, only 45 claims of allergic reactions to NRL products were filed by healthcare workers. Given the total number of Rhode Island healthcare workers employed during this time, the number of claims averaged less than 1.2 per 10,000 (0.012%) of healthcare workers annually. Of those who filed claims, 73.3% required no time off and in only 3 cases (6.6%), did the employees require more than one month off.

The total cost engendered by the NRL allergy claims was $47,937.07 between 1992 – 1999, averaging $5,992.13 per year and approximately $0.12 per employed healthcare worker per year. In comparison, the total workers compensation claims made by Rhode Island healthcare workers for all other causes was $35,352,358.84, and thus, of all workers' compensation claims costs incurred by Rhode Island healthcare workers, less than 0.14% was attributable to workers affected by NRL allergic reactions. In contrast to the 45 cases of NRL related claims, other common healthcare workplace items resulted in significantly higher workplace injury rates. For example, from 1992-1999, there were 63 healthcare workers' compensation claims listing soap/detergent/cleaners as source of injury, 104 listing bags and sacks, 135 reporting pots/pans/dishes/trays, 261 noting chairs/benches/seats, 334 citing handtrucks/dollys/carts, 367 noting stairs/steps 426 from injuries related to the floor, and 427 attributed to furniture and fixtures. Healthcare workers reported over 9 times as many injuries resulting from accidents attributed to furniture/fixtures and the floor.

2) The results obtained in the State of Rhode Island are consistent with results from several other states also analyzed by the researchers. For example, in Kansas for the eleven year period (1987-1997) there were 0.796 workers' compensation claims filed related to NRL allergy per 10,000 healthcare workers annually. Of those claims, 82.5% of the claimants required no time off work. The average claim rate in the State of Minnesota for the ten year period 1988-1997 was 0.71

[45] Saxon, *supra,* at 204.

[46] T.G. Merrett, *supra,* at 29.

claims per 10,000 healthcare workers annually, and total costs associated with such claims averaged $0.295 per healthcare worker per year. In North Dakota, for a six year period examined (1992-1997) there were 1.52 NRL allergy claims per 10,000 healthcare workers annually. Of all claims during that period, 86.2% required no time off work. In the State of Maine for the period 1993-1997, the average number of NRL allergy claims was 0.64 per 10,000 healthcare workers.

WRITTEN STATEMENT OF CHARLES E. REED, M.D. BEFORE THE UNITED STATES HOUSE OF REPRESENTATIVES' SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS, COMMITTEE ON EDUCATION AND THE WORKFORCE

- **Introduction**

I am Charles E. Reed, MD, Emeritus Professor of Medicine, Mayo Medical School. Before retirement I had been head of the Division of Allergic Diseases and Internal Medicine at Mayo Clinic, and previously at the University of Wisconsin. I have served as President of the American Academy of Allergy and Immunology, Chairman of the American Board of Allergy and Immunology, Editor of the *Journal of Allergy and Clinical Immunology* and on various advisory committees of the NIH and FDA. I am a founding editor of the textbook, *Allergy Principles and Practice*, now in the fifth edition. I have published approximately 300 scientific papers about allergic diseases. Occupational allergy has been one of my interests, particularly the measurement of the concentration of allergens in the air at the workplace and the attempt to estimate the concentration that elicits symptoms. These comments and opinions are my own and do not represent any positions or policies of the Mayo Clinic, or any other organization. They have not been reviewed by any Mayo committee. They do, however, derive from many conversations with my colleagues there, and from the research we have conducted together. Much of the text of this statement is a preliminary version of a review article that my colleagues and I are preparing on the subject of the consequences of occupational latex allergy. The invitation to testify arrived while I was vacationing and unable to check the full text of some of the references.

Let me say first that I strongly support the need for education about allergy to natural rubber in the workplace. I have a serious concern, however, that some of the wording in this version of OSHA's Technical Bulletin document will do more harm than good.

As the Technical Bulletin indicates by its reference to our research (reference 1) we have been concerned about the problem of occupational allergy to latex for several years.[1] This concern led to the establishment of a working group at Mayo to control the problem. As a result of our ability to assay the concentration of allergen in the air at the workplace and in various rubber products, and perhaps more importantly because of the uniquely efficient centralized administration of the Mayo Medical Center, we were able to reduce exposure substantially.[2] To my knowledge the more than 100 members of the staff who had allergic disease from latex are now working at their usual positions without difficulty.[3]

However, patients coming to Mayo from other locations exhibit a new problem that is much more disruptive of patients' lives. In recent years, many articles have appeared expressing alarm about the risk of occupational allergy to latex. Many of these discussions of latex allergy are not only alarming but fail to consider several basic principles of allergic diseases. Examples of such statements include:

"Health care workers are at the highest risk of a clinical allergic emergency from exposure to high-allergen powdered latex gloves. To our knowledge, no other disease has had greater direct effect on these providers. With the findings that 17% of health care workers in one U.S. hospital were sensitized and 36% of atopic health care workers in one French study were sensitized, no greater threat exists to the careers and potentially the lives of health care workers."[4]

"However, protective equipment may cause allergic sensitization with the potential of severe, even life threatening reactions. Latex gloves, in particular have become problematic."[5]

"Many common health care and household devices can cause allergic reaction, ranging from mild rash to fatal anaphylactic shock."[6]

"Latex allergy: an emerging crisis in health care."[7]

Because of the sensationalism that has developed around latex allergy, some surgeons, anesthesiologists, nurses and other health professionals have become terrified of their workplace. Many of their symptoms are due to anxiety attacks. Often they have been led to fear that exposure to rubber in any form may kill them, and that as a result they will no longer be able to use their years of training and skills. They often conclude that their professional lives are over. The majority of cases of "latex allergy" that my colleagues are seeing now are of this type. Many of these patients do not even have IgE antibody to rubber allergens and have no response to deliberate heavy exposure. For these unfortunate people, the fear generated by the sensationalism is more disabling than the disease would ever be. My concern about the current draft of the Technical Bulletin is that its confusing and alarming wording will feed these fears and make the overall problem worse rather than better.

General Comments About the Technical Bulletin

- There is an important distinction between sensitization and allergic disease. Unfortunately, in several places in the Bulletin, such as the discussion on prevalence, the Bulletin uses the terms sensitization and latex allergy interchangeably. The term *sensitization* refers only to the presence of IgE antibody. *Allergic disease* results from the interaction of three independent variables; the amount of IgE antibody on mast cells, the amount of allergen in the tissue, and the degree of the body's response to the mediators released from mast cells by the binding of allergen to antibody. The mere presence of IgE antibody to rubber allergens does not mean disease. Many health care workers with IgE antibody do not have disease upon exposure.[8] The data regarding prevalence rates referenced in the OSHA's Bulletin refers to the prevalence of sensitization, not allergic disease. Finally, fewer than half of the children screened in allergy clinics or pre-operatively and found to have IgE antibody to latex suffer anaphylaxis during surgery.[9-14] It is wrong to conclude from prevalence studies of sensitization that they are an accurate measure of the prevalence of latex allergic disease.

- Making a distinction between the allergic reactions that occur at work and anaphylaxis during surgery or interventional medical examinations is essential to correctly understand occupational latex allergy. When describing the clinical effects of latex allergy in the occupational setting, the Bulletin fails to distinguish the different clinical manifestations of the disease among glove users and those who experience a reaction while undergoing an invasive medical procedure. Occupational allergy affects physicians, dentists, nurses, and other people who wear rubber gloves. Occupational allergy includes reactions to allergen on the skin (contact urticaria) and reactions to inhaled airborne allergen (rhinitis, conjunctivitis and asthma).

  Anaphylaxis occurs primarily in patients during surgery or medical examinations, especially examinations that involve insertion of balloon catheters. Anaphylaxis, a severe form of a disseminated allergic reaction, occurs when allergen is introduced into the blood circulation through injection, absorption through serous surfaces or the gastrointestinal mucosa.

  One practical significance of the distinction between occupational allergy and anaphylaxis during surgery and medical procedures is that measures reasonably designed to reduce environmental occupational exposure are very different than those needed to reduce the occurrence of anaphylaxis among surgical patients.

  My review of the literature that describes the outcome of 1258 cases of allergy to latex in hospital staff has identified only two cases in which systemic reactions to airborne allergen exposure have been substantiated.[1,15] Some of the papers do not contain sufficient detail to determine whether the use of the word "anaphylaxis" referred to mild systemic reactions or true anaphylaxis with hypotension and respiratory obstruction or whether the reaction occurred at work or during surgery or medical examination.[16] The symptoms in the two substantiated cases were flushing, angioedema, tachycardia and wheezing. Both responded promptly to treatment. Like individuals who have had many surgical procedures, health care workers with severe respiratory allergy to airborne rubber allergens can suffer anaphylaxis when they become patients.[1,2,16-19] They may also have reactions at home from condoms or toy balloons.[20-22] These items may contain high concentration of allergens.[23,24] In addition, many papers and OSHA's Bulletin mention the risk of death from anaphylaxis. My review of the medical literature uncovered only one fatal case of anaphylaxis.[25] This death occurred during a barium enema examination in 1988. At least 259 cases of anaphylaxis from latex have been reported since then, none of them fatal. The fact that these cases occurred in the operating room or other hospital locations where effective treatment is available lessens their risk.

  Finally, in evaluating the importance of occupational latex allergy as a factor in allergic symptoms away from the workplace it is important to keep in mind that symptoms may arise from cross reactions with fruit, and that patients allergic to latex frequently have other allergic conditions that can be responsible for their symptoms.

- The quantitative aspects of the problem also need to be considered in order to put latex allergy into a proper prospective when evaluating it as an occupational illness. There is a suggestion in the Bulletin that latex allergy is a major occupational illness in part because small levels of exposure will trigger serious illness. Actually, the occupational data suggests that latex concentrations are much lower than in other exposures we have studied which is consistent with our clinical experience that the illness that develops in health care workers is milder than that seen in other occupational settings. The airborne concentrations of rubber allergens should be considered in terms of the concentrations of other allergens that cause occupational asthma. The concentration of latex allergen in the air at various sites in hospitals where allergic workers report respiratory symptoms ranges from about 100 to 1,000 ng/m^3.[2,13,26-29] Most of these symptoms are rhino-conjunctivitis. The concentration of allergen required to cause asthma is considerably higher.[30] By comparison, for example, the concentration of soybean allergen in Barcelona, Spain, during days of epidemic asthma from soybean allergy was in the range of 1000 to 5000 ng/m^3. The concentration of egg protein in egg processing plants where up to 30% of the workers have asthma was still higher, 1,000 to 1,000,000 ng/m^3. Not surprisingly the asthma in the egg processing workers is substantially more severe than it is in the hospital workers allergic to latex. It is also relevant that these severely allergic patients in Barcelona or in the egg processing industry do not have anaphylaxis on airborne exposure. Realistic interpretation of the importance of various exposures needs to consider that trivial, low level exposures to latex allergen (as we have measured) are not likely to elicit more than trivial symptoms.

- Anaphylaxis also involves quantitative considerations. As mentioned above, the severity of the anaphylactic reaction depends upon three independent variables: the amount of antibody, the amount of antigen and the host response to the mast cell mediators. Antigen reaches the tissues through the circulation. In general anaphylaxis is most severe when the antigen is injected, especially intravenously. The amount of allergen absorbed after oral administration is considerably less, but may be greater through the rectum. Some information is available about the amount of allergen that causes anaphylaxis to allergens other than rubber. The amount of allergen delivered through the skin by an insect sting is on the order of micrograms; an allergen immunotherapy injection is also on the order of micrograms; a penicillin or muscle relaxant injection the amount is in milligrams; a peanut also contains milligrams. Little information is available about the amount of antigen required to induce latex anaphylactic reactions. We have not observed anaphylactic shock from skin testing. We have observed milder reactions consisting of flushing and urticaria from skin testing. The amount of allergen injected into the skin at the time of these tests is uncertain, but, based on the concentration in the skin test reagent and the volume of extract introduced into the skin, the amount is probably in the range of 100 to 1000 ng. These concentrations are not trivial and are well within the range of concentrations that are detectable by immunoassays. They are also within the range that might be expected to be absorbed from balloon catheters, rubber dams, or high allergen content latex gloves from contact with mucosal or serous surfaces. They are however much higher than could be expected to be absorbed from airborne or dermal exposure to latex under ordinary working conditions.

For the quantitative considerations I have raised to be translated into practical means of reducing exposures, it will be necessary to have a validated immunoassay method for the rubber allergens that investigators in the field can accept. It is now clear that measurement of protein by the modified Lowry or any other test of protein is neither sensitive nor specific enough to be useful.[23,24] Different laboratories use different immunoassays, and though the results are generally similar, they are not fully comparable. Furthermore, they are not yet simplified to the point that they are available outside of research laboratories.

- OSHA's Technical Bulletin includes recommendations to use powder-free gloves. In balancing this recommendation against what many believe to be the benefits of powdered gloves, it is important to keep in mind that latex allergy is caused by exposure to latex allergens, not cornstarch. The focus, therefore, should be on the total allergen level, not just the allergen carried on powder. Published studies have demonstrated that powder-free as well as powdered gloves can induce symptoms.[31] Simply using powder-free gloves will not solve the problem. There are powdered gloves on the market with very low allergen levels, and there are powder-free gloves with higher allergen levels.[32]

Conclusion

It is my opinion that if OSHA's Technical Bulletin is to fulfill its intended purpose of educating people about latex allergy, it must be accurate and not alarming. Unfortunately, there are many inaccurate and alarming statements in the document in its current form. Thank you for the opportunity to address this important problem.

Charles E. Reed, M.D.
Emeritus Professor of Medicine, Mayo Clinic
1862 22nd Avenue, N.E.
Rochester, MN 55906

Bibliography

1. Hunt LW, Fransway AF, Reed CE, et al. An epidemic of occupational allergy to latex involving health care workers. *Journal of Occupational & Environmental Medicine* 1995; 37:1204-1209.

2. Heilman DK, Jones RT, Swanson MC, Yunginger JW. A prospective, controlled study showing that rubber gloves are the major contributor to latex aeroallergen levels in the operating room. *Journal of Allergy & Clinical Immunology* 1996; 98:325-330.

3. Hunt LW, Boone-Orke JL, Fransway AF, et al. A medical-center-wide, multidisciplinary approach to the problem of natural rubber latex allergy. *Journal of Occupational & Environmental Medicine* 1996; 38:765-770.

4. Kelly, K.J., Walsh-Kelly, C.M., Latex Allergy: A Patient and Health Care System Emergency, *Journal of Emergency Nursing*, 1998; 24:539-45.

5. Burton AD. Latex allergy in health care workers. [Review] [137 refs]. *Occupational Medicine* 1997; 12:609-626.

6. Meeropol E. Latex allergy update: clinical practice and unresolved issues. [Review] [46 refs]. *Journal of Wound, Ostomy, & Continence Nursing* 1996; 23:193-196.

7. Bykowsky MJ. Latex allergy: an emerging crisis in health care. *Journal - South Carolina Medical Association* 1996; 92:267-270.

8. Douglas R, Morton J, Czarny D, O'Hehir RE. Prevalence of IgE-mediated allergy to latex in hospital nursing staff. *Australian & New Zealand Journal of Medicine* 1997; 27:165-169.

9. Meeropol E, Leger R, Frost J. Latex allergy in patients with myelodysplasia and in health care providers: a double jeopardy. *Urologic Nursing* 1993; 13:34-44.

10. Novembre E, Bernardini R, Brizzi I, et al. The prevalence of latex allergy in children seen in a university hospital allergy clinic [see comments]. Allergy: *European Journal of Allergy & Clinical Immunology* 1997; 52:101-105.

11. Nieto A, Estornell F, Mazon A, Reig C, Garcia-Ibarra F. Allergy to latex in spina bifida: a multivariate study of associated factors in 100 consecutive patients. *Journal of Allergy & Clinical Immunology* 1996; 98:501-507.

12. Pittman T, Kiburz J, Gabriel K, Steinhardt G, Williams D, Slater J. Latex allergy in children with spina bifida. *Pediatric Neurosurgery* 1995; 22:96-100.

13. Liss GM, Sussman GL, Deal K, et al. Latex allergy: epidemiological study of 1351 hospital workers. *Occupational & Environmental Medicine* 1997; 54:335-342.

14. Vogel LC, Schrader T, Lubicky JP. Latex allergy in children and adolescents with spinal cord injuries. *Journal of Pediatric Orthopedics* 1995; 15:517-520.

15. Spaner D, Dolovich J, Tarlo S, Sussman G, Buttoo K. Hypersensitivity to natural latex. *Journal of Allergy & Clinical Immunology* 1989; 83:1135-1137.

16. Yassin MS, Lierl MB, Fischer TJ, O'Brien K, Cross J, Steinmetz C. Latex allergy in hospital employees. *Annals of Allergy* 1994; 72:245-249.

17. Palczynski C, Walusiak J, Ruta U, Gorski P. Occupational allergy to latex--life threatening reactions in health care workers. Report of three cases. *International Journal of Occupational Medicine & Environmental Health* 1997; 10:297-301.

18. Warpinski JR, Bush RK. Latex hypersensitivity [letter; comment]. *American Journal of Medicine* 1991; 90:769-770.

19. Pecquet C, Leynadier F, Dry J. Contact urticaria and anaphylaxis to natural latex. *Journal of the American Academy of Dermatology* 1990; 22:631-633.

20. Sussman GL, Lem D, Liss G, Beezhold D. Latex allergy in housekeeping personnel. *Annals of Allergy, Asthma, & Immunology* 1995; 74:415-418.

21. Taylor JS, Cassettari J, Wagner W, Helm T. Contact urticaria and anaphylaxis to latex. *Journal of the American Academy of Dermatology* 1989; 21:Pt 2):874-7.

22. Oei HD, Tjiook SB, Chang KC. Anaphylaxis due to latex allergy. Allergy Proceedings 1992; 13:121-122.

23. Baur X, Chen Z, Raulf-Heimsoth M, Degens P. Protein and allergen content of various natural latex articles. *Allergy* 1997; 52:661-664.

24. Yunginger JW, Jones RT, Fransway AF, Kelso JM, Warner MA, Hunt LW. Extractable latex allergens and proteins in disposable medical gloves and other rubber products. *Journal of Allergy & Clinical Immunology* 1994; 93:836-842.

25. Ownby DR, Tomlanovich M, Sammons N, McCullough J. Anaphylaxis associated with latex allergy during barium enema examinations. *AJR* 1994; 903-908.

26. Swanson MC, Bubak ME, Hunt LW, Yunginger JW, Warner MA, Reed CE. Quantification of occupational latex aeroallergens in a medical center. *Journal of Allergy & Clinical Immunology* 1994; 94:Pt 1):445-51.

27. Tarlo SM, Sussman G, Contala A, Swanson MC. Control of airborne latex by use of powder-free latex gloves. *Journal of Allergy & Clinical Immunology* 1994; 93:985-989.

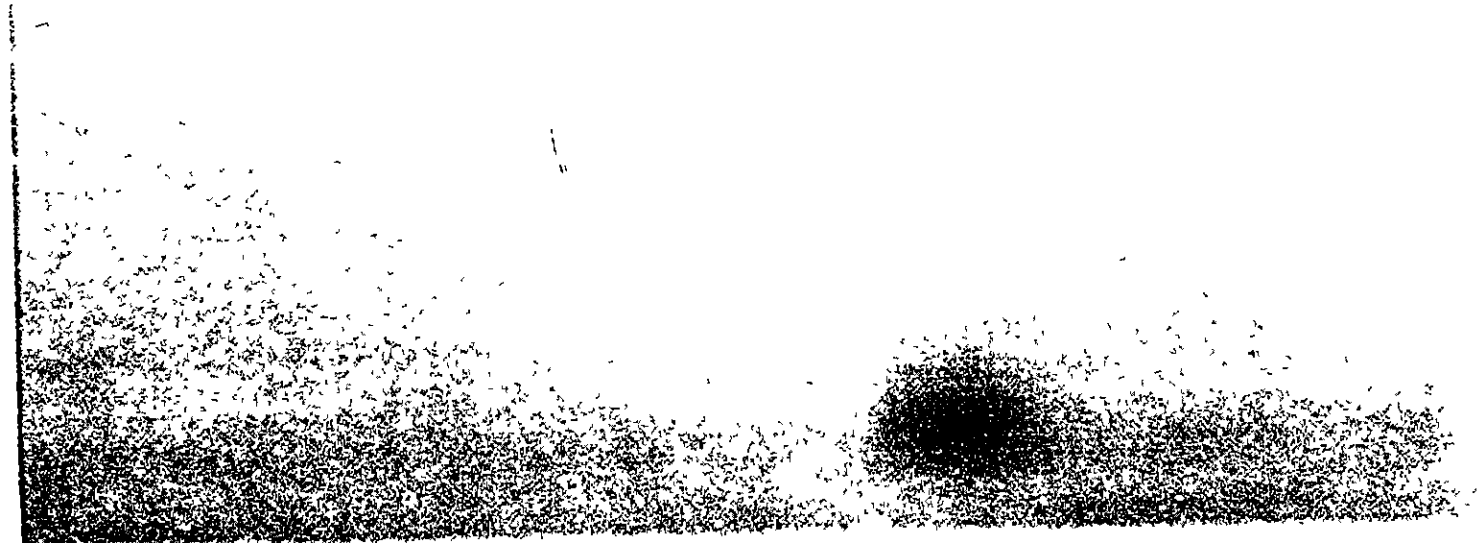
28. Baur X, Ammon J, Chen Z, Beckmann U, Czuppon AB. Health risk in hospitals through airborne allergens for patients presensitised to latex. *Lancet* 1993; 342:1148-1149.

29. Baur X, Chen Z, Allmers H. Can a threshold limit value for natural rubber latex airborne allergens be defined? *Journal of Allergy & Clinical Immunology* 1998; 101:Pt 1):24-7.

30. Loaprasert N, Swanson MC, Jones RT, et al. How much latex aeroallergen is required to induce symptoms in latex-sensitive healthcare workers? *Journal of Allergy & Clinical Immunology* 1998; 101:S165(Abs)

31. Vandenplas, O., Delwiche, J., Depelchin, S., Sibille, Y., Vande Weyer, R., Delaunois, L., Latex gloves with a lower protein content reduce bronchial reactions in subjects with occupational asthma caused by latex, *Am. J. Respir. Crit. Care Med.*, 1995

32. Yunginger, Jones, Fransway, Kelso, Warner, Hunt, Extractable latex allergens and proteins in disposable medical gloves and other rubber products, *J. Allergy Clin. Immunol*, 5/94



Prevalence of IgE to natural rubber latex in unselected blood donors and performance characteristics of AlaSTAT testing

Andrew Saxon, MD*; Dennis Ownby, MD†; Thomas Huard, MD‡; Romain Parsad, MS§; and H Daniel Roth, PhD§

Background: The prevalence of IgE to natural rubber latex (NRL) proteins in the general population remains unsettled, both because of the difficulty of obtaining an unbiased population representative of the general population of the United States and because of concerns about the reproducibility of tests for anti-latex IgE antibodies. Establishing the prevalence in the population is important toward defining the potential risks of persons entering areas where latex exposure may occur.

Objective: The purposes of this study were to determine the prevalence of IgE to latex in a general population and to assess the performance characteristics of the AlaSTAT microtiter plate test for anti-latex IgE when performed independently by different laboratories.

Methods: One thousand nine hundred and ninety-seven consecutive blood samples obtained from the Oklahoma Blood Institute were assayed independently in three laboratories for IgE to NRL using the FDA-approved AlaSTAT ELISA for IgE to NRL. The group consisted of 56% men and 44% women. Ninety percent were Caucasian, 4% African American, and 6% were "other."

Results: The prevalence IgE to NRL between the 3 laboratories varied from 5.4% to 7.6% at the designated cut off of 0.35 kU/L. Examination of results for specific individuals demonstrated >90% agreement between the three sites with the most reproducible results at the Class II cutoff of ≥0.7 kU/L. There was no difference in the percent of positive values at the three laboratories.

Conclusions: There is good agreement between laboratories as to NRL IgE reactive and non-reactive sera using the AlaSTAT test. This report of the largest sample of blood donors confirms earlier reports as to the prevalence of IgE NRL in blood donors.

Ann Allergy Asthma Immunol 2000;84:199–206

INTRODUCTION

While immediate type allergic reactions may have occurred following exposure to natural rubber latex (NRL) for many years, latex allergy has only been commonly recognized since the late 1980s.[1–4] IgE-mediated immediate hypersensitivity reactions became the focus of particular attention after serious reactions were observed among children who had medical problems requiring multiple surgeries.[5] Subsequently a fatality from latex allergy was reported in relation to the latex balloon on a barium enema catheters.[6] Following these early reports of severe reactions there has been increasing concern about what groups are at risk for latex allergy and whether this risk can be reduced. This lead to attempts to determine the prevalence of sensitization to NRL, as defined by IgE antibodies specific for NRL proteins. While many persons with IgE to latex do not show clinical reactivity, it is among such sensitized subjects that immediate hypersensitivity reactions may occur.

Multiple reports have suggested children with spina bifida or other urogenital anomalies requiring frequent urogenital surgery are at high risk of developing IgE to NRL.[5,7,8] Similarly, atopy has repeatedly been found to be a risk factor for sensitization to NRL proteins.[2,9–13] On the other hand, the role of occupational factors such employment in the NRL or health care industry in causing sensitization to NRL remain inconclusive. Whether the reported prevalence of IgE to NRL of 8.9% to 17.6% in various samples of health care workers represents an increased risk of latex allergy depends upon the prevalence of latex allergy among persons employed in other occupations and as well as factors such as selection bias in the groups studied.[14,15] Many studies of health care workers lack appropriate control groups of sufficient size to allow valid statistical comparisons between individuals in health care and other occupations. Furthermore, studies comparing controls using different methods of testing, eg, skin testing or even the same method of testing by different investigators may be difficult to compare.

Some have suggested that prevalence of sensitization to latex is as low as less than 1.0% in adult non-health care workers.[16,17] In contrast, Ownby et al reported that the prevalence of detectable latex specific IgE antibodies was 6.4% in 1000 blood donors using the initial FDA approved AlaSTAT

* Division of Clinical Immunology & Allergy, UCLA School of Medicine, Los Angeles, California.
† Medical College of Georgia, Augusta, Georgia.
‡ Sparrow Hospital, Lansing, Michigan.
§ Roth Associates Inc, Rockville, Maryland.
Supported by the Allegiance Health Care Corporation.
Received for publication April 4, 1999.
Accepted for publication in revised form August 12, 1999.

test[18] which was performed in tubes. A subsequent study by the CDC of serum samples obtained during the third National Health and Nutritional Examination Survey (NHANES III) found that 17.6% of that population had detectable IgE antibodies to NRL. The NHANES analysis also used the AlaSTAT tube assay, reducing the probability that the differences between the blood donor study and the NHANES study were related to the use of different assays.[19]

The present study was undertaken to further evaluate the prevalence of IgE antibodies to NRL among large numbers of unselected blood donors and to assess the performance of the AlaSTAT assay when performed in parallel by multiple laboratories on large numbers of samples Beyond the prevalence of latex sensitization in a relatively unselected population, we specifically wanted to learn the reproducibility of the AlaSTAT in different laboratories when large numbers of samples with a low probability of detectable IgE to NRL were processed.

MATERIALS AND METHODS

Blood Samples

Blood samples were obtained 1,997 consecutive adult blood donors from the Oklahoma Blood Institute. The group consisted of 56.3% men and 43.7% women. Of these, 89.6% listed themselves as Caucasian, 3.8% as African American, and 6.6% as other. Blood was allowed to clot before serum was separated. Each serum sample was aliquoted into identically numbered tubes and frozen at −18°C within 5 days of being obtained. After all the samples had been collected, the frozen samples were mailed overnight to the individual test sites. All samples arrived frozen and were kept frozen until being assayed. Samples were not linked to individuals for reasons of confidentiality.

IgE Anti-Latex Assay

Samples were tested for latex specific anti-IgE using the FDA approved AlaSTAT system from Diagnostic Products Corporation, Los Angeles, CA.[20] All centers used the AlaSTAT ELISA automated microtiter plate system. Each center used only sets of reagents from the same manufacturer's lots.

Assay Protocol

A protocol for assaying all samples was established prior to the start of the study and followed throughout the study. Briefly, the manufacturer's recommendations were followed with samples having anti-latex IgE levels of 0.35 kU/L or greater being considered positive. All samples were initially assayed in duplicate independently in each laboratory. If the sample values were ≥0 35 kU/L but the duplicates varied by 35%, the sample was reassayed in duplicate All samples with values between 0 25 and 0 45 kU/L were automatically reassayed in duplicate This range was chosen because at the 0 35 positive cutoff point the CV of the assay is about 20% and thus 0 25 to 0 45 represents about a 90% confidence interval On such samples, if the original and reassay data were consistent in terms of being positive or negative, the original value was accepted. If the original and reassay data were inconsistent concerning whether the sample was ≥0 35 kU/L, the sample was reassayed a third time in duplicate and the sample was assigned the value of the two consistent assays. Thirty-seven, 115, and 38 samples had to be reassayed at Henry Ford, Sparrow Lansing, and UCLA respectively and of these 1, 2, and 10 had to be reassayed a second time.

For each laboratory the results were tabulated showing the number and percent of positive results (≥0.35 kU/L) as well as the minimum, maximum, median, and quartile values for positive results obtained by that laboratory. For analysis, three definitions of positive assays are given, a 0.35 kU/L cutoff, a 0.70 kU/L cutoff, and a 3.50 kU/L cutoff which represent Class I, II, and III reactions respectively as defined by the manufacturer.

An internal positive serum control suggested by the manufacturer was run in all assays. This serum sample was positive to dust mite (*Dermatophagoides farinæ*). This control served as an additional check on results at the three sites While this additional control is not furnished with the kits as purchased, it is available from the kit's manufacturer (Diagnostic Products Corporation, Los Angeles, CA). The mean levels of dust mite controls (±SD) at the three laboratories were 2.13 units (SD = .07, range 1 97 to 2 29) at Henry Ford, 2 53 (SD = 08, range 2 36 to 2 70) at UCLA, and 2 29 (SD = 05, range 2.19 to 2.40) at Sparrow Hospital The levels at UCLA were statistically significantly greater (P = 05) than the other two sites There was no relationship between the level of reactivity on this dust mite internal control and the percent of samples tested as positive to latex

As in any in vitro assay, the level of background may affect the percent of reported positive results depending on the difference between the background reading, the variability of the assay and the cutoff established for a positive result. This becomes particularly important when testing a general population where the prevalence of a positive result is likely to be low as higher non-specific background binding will result in more false positive results. To examine this issue, we calculated the mean and standard deviation for all tests having a negative (<0.35 kU/L) value for Henry Ford, Sparrow Hospital, and UCLA. These were 0.043 ± 0.052, 0.061 ± 0.064, and 0.005 ± 0.025 respectively. We also analyzed the level of background by determining the distribution of results for the first three quartiles of samples. The third quartile (containing 75% of all readings) for Henry Ford was 0.06; for Sparrow Hospital, 0.10; and for UCLA, 0.00 kU/L. Thus all three laboratories had low of backgrounds in the assays. Treating values below 0.035 kU/L as a continuous variable, there was no statistical difference between the values from the three laboratories. A nonparametric test ranking the levels generated by each laboratory for each subject, however, showed that UCLA generated the lowest values (mean rank 1.25), Ford generated the

Table 1 Number and Percent of the Oklahoma Study Population that are Latex Sensitive at Different AlaSTAT® Cutoff Levels

AlaSTAT® Cutoff Level/Institution	0.35 kU/L		0.70 kU/L		3.50 kU/L	
	# Positive	Rate	# Positive	Rate	# Positive	Rate
Henry Ford	108	5 41	78	3 91	8	0 40
Sparrow Lansing	152	7.61	87	4 36	9	0 45
UCLA	139	6 96	87	4 36	10	0 50

median values (mean rank 2.26), and Lansing had the highest values (mean rank 2.49) The difference in ranks between UCLA and Ford, UCLA and Lansing, and Ford and Lansing were all statistically significant at the <.05 level

Statistical Analyses

Data tabulations, computation of medians and quartiles, as well as comparisons of results from different laboratories were performed using SAS software programs. Chi-Square and Mantel Haensel tests were employed to assess the statistical significance of differences between laboratories These latter tests were performed on EXCEL Microsoft software and checked using a hand programmable calculator.

RESULTS

The rate of latex sensitivity by cutoff point and by laboratory is given in Table 1. Using the suggested 0.35 kU/L cutoff for a positive reading, the rate based on the Henry Ford results is 5 4% as compared with 7 6% for Sparrow Hospital and 7.0% for UCLA The difference between the rate based on the Henry Ford findings and the UCLA results is statistically significant at the .01 level (Chi-Square 8.0, df = 1) as was the difference between Henry Ford and Sparrow Hospital (Chi-Square 4 1, df = 1). Although the laboratories used identical specimens, identical reagents, and were trained by the manufacturer, the statistically significant different rates suggest an important component of operator dependence is evident in the Class I specimens. For all values of 0 65 kU/L which includes the Class II cutoff (ie, 0.70 kU/L) and above, there are no statistically significant differences between the data generated by the different labs At the 0.70 kU/L cutoff, 3 9% were NRL sensitive based on the Henry Ford lab as compared with 4.4% based on the Sparrow Hospital and the UCLA labs. Pairwise comparisons using the Manzel-Haensel test showing that there was no significant difference for all three centers at a value 0 75 kU/L (Table 2) It should be noted that there were no significant differences between the UCLA and Sparrow Hospital results at 0 35 and above For the 3 5 kU/L cutoff, the rate is 0 4% based on the Henry Ford lab, 0 45% based on the Sparrow Hospital lab, and 0 50% based on the UCLA lab The overall distribution of the values for the individual samples is given in Figure 1 while the insert shows the distribution of the positive values on an expanded scale Importantly, the vast majority of values for negative results are well below the 0.35 kU/L cutoff with the mean for the negative values being 0 038 kU/L

A description of the distribution of positive (≧0 35 kU/L) AlaSTAT results from each laboratory is given in Table 3 In pairwise comparisons of the median levels Henry Ford had sta-

Table 2. Discordance Among Centers at Different Cutoff Values (kU/L)

0.35 kU/L				0.55 kU/L				0.75 kU/L			
	Ford				Ford				Ford		
UCLA	Y	N	Total	UCLA	Y	N	Total	UCLA	Y	N	Total
Y	103	36	139	Y	82	26	110	Y	68	15	83
N	5	1853	1858	N	5	1882	1887	N	6	1908	1914
	108	1889	1997		87	1910	1997		74	1908	1914
P value	0 00			*P* value	0.00	Tc	*P* value	0 08			
	Lansing				Lansing				Lansing		
UCLA	Y	N	Total	UCLA	Y	N	Total	UCLA	Y	N	Total
Y	110	29	139	Y	85	25	110	Y	58	25	83
N	42	1816	1858	N	23	1864	1887	N	26	1888	1914
	152	1845	1997		108	1889	1997		84	1913	1997
P value	0.15			*P* value	0.89			*P* value	1.00		
	Lansing				Lansing				Lansing		
Ford	Y	N	Total	Ford	Y	N	Total	Ford	Y	N	Total
Y	98	10	108	Y	75	12	87	Y	60	14	74
N	54	1835	1889	N	33	1877	1910	N	24	1899	1923
	152	1845	1997		108	1889	1997		84	1913	1997
P value	0 00			*P* value	0 00			*P* value	0.14		

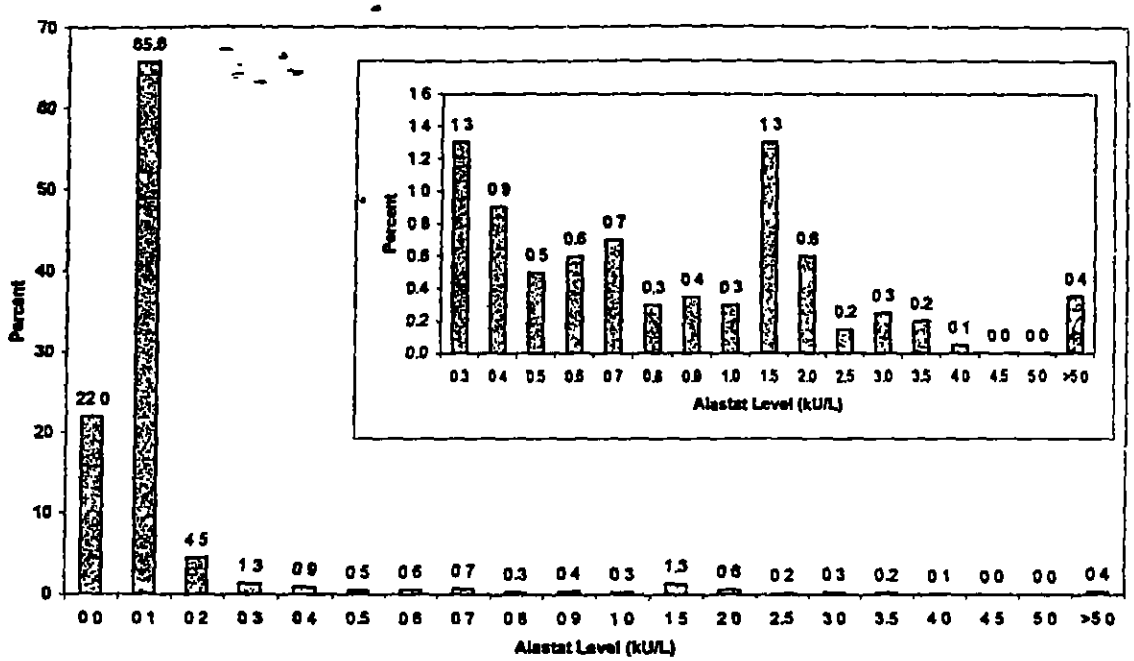


Figure 1 Distribution as percent of total (n = 1997) of latex IgE sample values from the Oklahoma blood donors assayed at Henry Ford Hospital, Sparrow Hospital, and UCLA Medical Center The average of the value for each sample as assayed the three centers was plotted on this histogram The mean value for negative samples (values below 0 35 kU/L) was 0 038 kU/L The insert shows the distribution for values at 0 30 or above on an expanded scale

Table 3 Summary Statistics of Serum-Positive Anti-Latex IgE Results*

Analyzed at	# Positive	Total Samples	% Positive	Minimum (IU/mL)	1st Quartile (IU/mL)	Median (IU/mL)	3rd Quartile (IU/mL)	Maximum (IU/mL)
UCLA	139	1997	7 0	0 35	0 57	0 87	1 55	44 13
Henry Ford	108	1997	5 4	0.36	0 67	1 01	1 65	30 48
Sparrow Lansing	152	1997	7 6	0 35	0 52	0 80	1.29	16 81

* Positive result was defined as ≥0 35 kU/L.

tistically significantly higher levels than Sparrow Hospital ($P < .04$), but this significance disappears after multiple comparison adjustments are made. Any differences in latex positivity rates can not be ascribed to increased general binding in the assay at the different sites as shown by the level of positive control binding using the internal dust mite controls (see "Materials and Methods").

Of even greater interest is a comparison of results for individual samples assayed in the three participating laboratories. Using the recommended 0.35 kU/L cutoff, 1815 of the 1997 (90.9%) samples are negative in all three laboratories while 94 (4.7%) are positive (≧0.35 AU) in all laboratories. Among samples where discrepant results were found, 29 (1.5%) were positive in two of the three laboratories, while 59 (3.0%) were positive in a single laboratory. As shown in Table 4a–c results between laboratories were rarely discrepant by more than one class. Only eight of 1996 samples (0.4%) produced results differing by more than one class when comparing Henry Ford and UCLA, 13 samples (0.6%) when comparing Henry Ford and Sparrow Hospital, and 20 samples

Table 4a. Pair Comparisons of AlaSTAT Results at the Henry Ford Hospital and UCLA

AlaSTAT® kU/L	UCLA Class	Henry Ford Class					Total
		O	I	II	III	IV	
<0.35	O	1853	4	1	0	0	1858
0.35–0.69	I	29	18	5	0	0	52
0 70–3.49	II	6	8	62	1	0	77
3 50–17.49	III	1	0	2	6	0	9
17.50–52.49	IV	0	0	0	0	1	1
	Total	1889	30	70	7	1	1997

Table 4b Pairwise Comparisons of AlaSTAT® Results at the Sparrow Lansing and UCLA

AlaSTAT® kU/L	UCLA Class	Sparrow Lansing Class					Total
		O	I	II	III	IV	
<0 35	O	1816	32	10	0	0	1858
0 35–0 69	I	20	17	15	0	0	52
0.70–3 49	II	6	15	51	3	0	77
3.50–17 49	III	1	1	2	5	0	9
17 50–52.49	IV	0	0	0	1	0	1
	Total	1845	65	78	9	0	1997

Table 4c. Pairwise Comparisons of AlaSTAT® Results at the Sparrow Lansing and Henry Ford

AlaSTAT® kU/L	Henry Ford Class	Sparrow Lansing Class					Total
		O	I	II	III	IV	
<0 35	O	1835	43	11	0	0	1889
0.35–0 69	I	8	9	13	0	0	30
0 70–3 49	II	2	13	53	2	0	70
3 50–17 49	III	0	0	1	6	0	7
17.50–52 49	IV	0	0	0	1	0	1
	Total	1845	65	78	9	0	1997

(1.0%) when comparing UCLA and Sparrow Hospital.

In 11 cases, UCLA generated higher corresponding levels than Henry Ford and in 46 cases Henry Ford generated higher levels than UCLA. In a comparison of the corresponding results between Sparrow Hospital and UCLA in 94.6% (1889/1997) of the samples, the two labs generated corresponding results, in 60 instances UCLA generated higher results than Sparrow Hospital, and in 48 cases Sparrow Hospital generated higher levels than UCLA. Finally, there is agreement between the Sparrow Hospital and the Henry Ford results in 95.3% (1903/1997) of the cases.

DISCUSSION

The present multicenter study examined the largest number (nearly 2000) to date of unselected subjects for IgE to NRL. It is the only study to have compared results on the same samples assayed at different independent sites while employing the identical FDA approved methodology. Using the generally accepted 0.35 kU/L cutoff for a positive test, we found that between 5.4% and 7.6% of random blood donors had IgE that reacted with NRL The combined results from this study are very comparable to the 6.4% obtained with blood donors from Southeastern Michigan [18] The previous study in Michigan also used the same AlaSTAT testing method. There was some difference in prevalence between the laboratories at the 0.35 kU/L level with Henry Ford showing a statistically decreased percent (5.4) compared with the other two sites (7.0% and 7.6%). This resulted from differences in assigning class O or I values for samples at the low end of the assay range (Table 4a–c). However, here was no difference at the 0.7 kU/L level or above (Table 2). Thus values below the class II cut off should best be considered equivocal even with repeat testing as performed here and certainly a single value in this range should not be taken a proof positive of IgE antibodies to NRL.

In this study, we employed the microtiter plate AlaSTAT ELISA to measure IgE to NRL proteins. The AlaSTAT ELISA was the first FDA-approved methodology for this purpose in the USA making it a method commonly employed in earlier but less extensive studies. This methodology has been critiqued as being "too sensitive,"[21] a critique based on what others have expected to find and the results of non-comparable testing, eg, skin testing using non-standardized materials Furthermore, one can not use clinical reactivity as the "bench mark" against which to determine the specificity of in vitro testing for IgE to NRL or any other common allergen Indeed, many and often the majority of subjects with IgE to a given allergen may not manifest clinical reactivity, but that does not mean the tests are not a valid measure of IgE to the allergen in question Thus, as with other allergen testing (skin or in vitro testing), use of the AlaSTAT assay is appropriate for seroepidemiologic studies, whose purpose is to determine the prevalence of IgE antibodies to NRL. In doing so, one has to be aware of the ever present issues of sensitivity, specificity, and the balance between false positive and false negative results depending upon the true prevalence in the population being tested On the other hand, since many persons with IgE to NRL do not manifest clinical reactivity, this test is not an appropriate clinical screening tool for unselected individuals, as it will identify a large numbers of subjects that do not clinically react. This same situation holds for IgE screening for foods, pollens, and bee venom.

At present, there is no properly standardized skin test reagent for NRL allergen, generally available anywhere in the world, and there is no licensed skin test material in the USA. The availability of a reproducible in vitro methodology such as the AlaSTAT assay allows for standardized testing and comparisons. To achieve this, however, such testing must be reproducible. We therefore undertook a direct comparison of the technology at three different sites. We used the same lots of reagents to test the samples with the results of coded samples being supplied to an independent statistical unit

which had no knowledge of the samples assayed. There was excellent agreement as the value assigned to individual samples at the 0 7 or greater kU/L levels demonstrating favorable performance characteristics of the testing.

The finding that about 7% of unselected blood donors have IgE to latex is not unexpected Natural rubber latex products are ubiquitous in our environment. Natural rubber latex exposure begins in infancy from exposures to NRL, eg, in bottle nipples and pacifiers.[22] Furthermore, NRL particles with detectable NRL allergens have been reported in road side dust as the result from tire wear particles [23,24] Second, a very large and growing number of plant materials, including foods and pollens, have been shown to cross-react with NRL protein allergens.[25-33] Exposure to these materials begins at infancy, is universal, and IgE antibodies to such materials are common in the atopic population It is worth noting that the atopic population has consistently shown increased rates of sensitization to NRL Given these sources of NRL and NRL cross-reacting antigens, our results are comparable to the level of IgE antibody to other commonly encountered antigens such as pollen, bee venom, or penicillin [34-37] Indeed, the prevalence of IgE to bee venom, another common allergen, has been found to be between 15% and 25% in unselected populations [38]

Grzybowski et al found that 8.8% (95% confidence interval 6 7% to 10.8%) of registered nurses has a positive AlaSTAT ELISA for anti-latex IgE.[14] Given the 90.6% recruitment in that study, the prevalence may have been as low 7.9% due to selection bias in participation by those who felt they might be reactive to NRL. Ledenbom-Mansour et al[39] studied 996 surgical patents who were over 18 years old and found sixty-seven (6 7%) had a positive IgE to latex as measured by the AlaSTAT ELISA. Non-Caucasians had greater rates of sensitization than did Caucasians (9.8 versus 4.3, $P = .001$). Porri et al[40] studied latex sensitization in 258 twenty to forty year old subjects attending a health screening in France They found that 6 6% of subjects showed IgE to latex as determined by skin testing or the Pharmacia CAP assay to latex A study of latex allergy in blood donors from the UK also found a very similar prevalence of latex sensitization at 7.7%[41] as did a report that 8 6% of nursing volunteers were found to be positive for IgE to NRL prior to beginning clinical training.[42] Given the variability for low positive results as seen in our study when even using the exact same assay and sera, all these cited studies are in a range very similar to what we detected.

Results using the AlaSTAT ELISA can not be directly compared with results using different in vitro techniques Indeed, Ebo et al[43] used a similar assay, the AlaSTAT RIA, a solid phase radioimmunoassay, and the Immuno-CAP to determine the sensitivity and specificity assays for IgE to NRL in Belgium. They found a specificity of only 33% using the ≥0.35 kU/L cutoff for the AlaSTAT RIA If the cutoff was raised to 0 55 kU/L, then the results were comparable to the Pharmacia CAP assay and to the results we report using AlaSTAT ELISA. With the data provided in that paper, one can not access the level of background binding in their work to determine if the assay background was higher than desirable which may have resulted in decreased the specificity at the 0 35 kU/L cutoff Additionally, the reagents used in AlaSTAT RIA as employed in the Ebo study were research reagents that have been reformulated but remain as research reagents (personal communication, Dr. Jay Weiss, Diagnostic Products Corporation, Los Angeles, CA). Samples (5524) from the third National Health and Nutritional Examination Survey (NAHNESIII) were assayed by CDC using the earlier AlaSTAT tube assay and 17.6% of those samples were positive for IgE antibodies to NR at 0.35 kU/L. This analysis used an older tube version of the AlaSTAT test which employs a static rather than kinetic measurement of antibody interaction. Importantly, the mean level for the negative samples from NHANESIII was 0 120 kU/L or more than 3-fold higher as compared with the value of 0 038 kU/L in our study This suggests that increased nonspecific background binding of the sera in NHANESIII assay accounts for the high levels of positivity at the 0.35 kU/L level. This would not be surprising in an assay which is highly operator dependent Using a 1.5 kU/L cutoff, the NHANES III data would give results that mirrors those seen in our population

Using a variety of approaches, investigators have attempted to identify populations "at risk for NRL allergy " The early studies employed skin tests or in vitro tests of unknown sensitivity and specificity. Our results show that the general population can appropriately be considered "at risk " Groups reproducibly identified to be at increased risk for sensitization to NRL are persons with spina bifida/multiple genitourinary tract surgery from an early age and persons with atopy.[5,7-13] While other groups have been suggested to be at increased risk for sensitization due to occupational exposure, eg, health care workers and NRL workers, the data for this is not convincing. The main problem with the studies from which those conclusions are drawn, is that they suffer from major problems with ascertainment bias and failure to include all the necessary controls. Only through carefully designed studies with appropriate control populations, such as we have studied, and by employing reproducible and comparable methodologies can the comparisons be made to determine whether there is an increased risk of latex sensitization from activities such occupational exposure, condom use, or other environmental factors.

ADDENDUM

A recently released report* from the Hazard Evaluation and Technical Assistance branch of NIOSH found that latex sensitization, defined by a positive Pharmacia CAP test of ≥ 0.35 kU/L, was present in 6.3% of hospital employees who did not wear latex gloves and 6.1% of those who did.

These numbers are remarkably similar to the general population of blood donors whom we studied. In addition, that study found no relationship between any parameter of latex glove use, such as duration of employment as a health care worker and latex sensitization. The only positive association with latex sensitization was the presence of atopy. Finally there was no significant difference in work related asthma or general urticaria associated with the presence of latex sensitization.

*Page EH and Esswein EJ. HETA Health Hazard Evaluation Report 98-0096-2737 Exempla St. Joseph Hospital Denver, Colorado. NIOSH, Center for Disease Control and Prevention, United States Department of Health and Human Services, 1999.

ACKNOWLEDGMENT

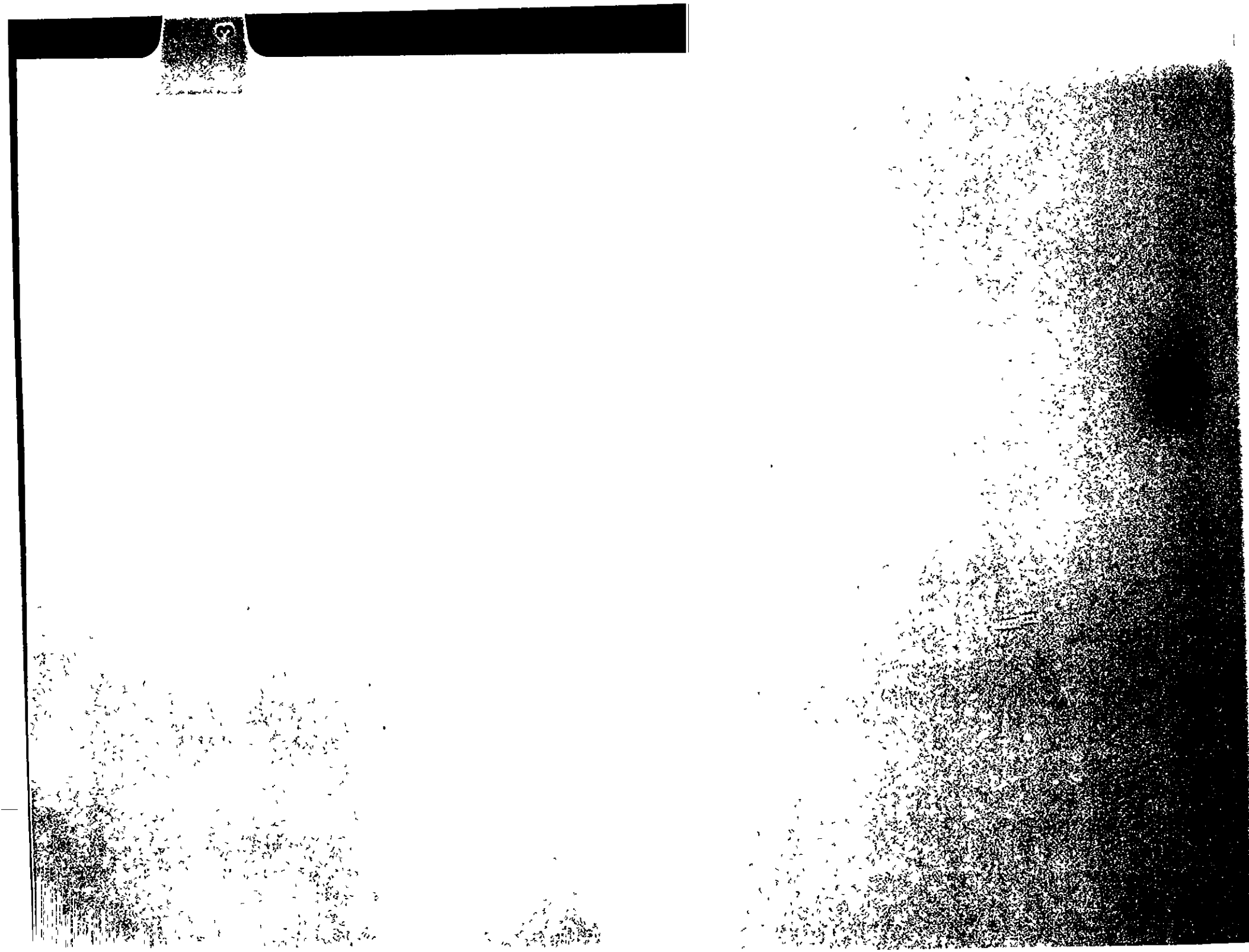
We would like to thank Ms. Minna Jyrala and Mr Dennis Keagle for their excellent technical assistance.

REFERENCES

1. Carrillo T, Cuevas M, Munoz T, et al Contact urticaria and rhinitis from latex surgical gloves. Contact Dermatitis 1986;15:69–72.
2. Turjanmaa K. Incidence of immediate allergy to latex gloves in hospital personnel. Contact Dermatitis 1987;17: 270–275.
3. Seifert HU, Seifert B, Wahl R, et al. Immunoglobulin E-mediated contact urticaria and bronchial asthma caused by household rubber gloves containing latex. 3 case reports. Dermatosen in Beruf und Umwelt. Occupational and Environmental Dermatoses, 1987;35: 137–139.
4. Axelsson JG, Johansson SG, Wrangsjo K. IgE-mediated anaphylactoid reactions to rubber. Allergy 1987;42: 46–50.
5. Gold M, Swartz JS, Braude BM, et al. Intraoperative anaphylaxis: an association with latex sensitivity. J Allergy Clin Immunol 1991,87·662–666.
6. Ownby DR, Tomlanovich M, Sammons N, et al. Anaphylaxis associated with latex allergy during barium enema examinations Am J Roentgenol 1991,156 903–908
7. Leger RR, Meeropol E Children at risk. latex allergy and spina bifida. J Pediatr Nursing 1992,7.371–376
8. Ylitalo L, Turjanmaa K, Palosuo T, et al Natural rubber latex allergy in children who had not undergone surgery and children who had undergone multiple operations. J Allergy Clin Immunol 1997,100 606–612.
9. Dry J, Leynadier F, Pecquet C Immediate allergy to latex 12 cases Ann Med Intern 1989,140 691–693
10. Bubak ME, Reed CE, Fransway AF, et al Allergic reactions to latex among health-care workers Mayo Clin Proc 1992,67 1075–1079
11. Yassin MS, Sanyurah S, Lierl MB, et al Evaluation of latex allergy in patients with meningomyelocele Ann Allergy 1992,69 207–211
12. Shield SW, Blaiss MS Prevalence of latex sensitivity in children evaluated for inhalant allergy Allergy Proc 1992,13 129–131.
13. Reinheimer G, Ownby DR Prevalence of latex-specific IgE antibodies in patients being evaluated for allergy [see comments] Ann Allergy Asthma Immunology 1995,74 184–187.
14. Grzybowski M, Ownby DR, Peyser PA, et al The prevalence of anti-latex IgE antibodies among registered nurses J Allergy Clin Immunol 1996; 98 535–544.
15. Mace SR, Sussman GL, Liss G, et al. Latex allergy in operating room nurses. Ann Allergy Asthma Immunol 1998;80.252–256
16. Tomazic VJ, Withrow TJ, Fisher BR, et al Latex-associated allergies and anaphylactic reactions Clin Immunol Immunopath 1992,64.89–97.
17. Turjanmaa K, Reunala T. Contact urticaria from rubber gloves. Dermatol Clin 1988;6.47–51.
18. Ownby DR, Ownby HE, McCullough J, et al. The prevalence of anti-latex IgE antibodies in 1000 volunteer blood donors. J Allergy Clin Immunol 1996; 97:1188–1192.
19. U.S. Department of Health and Human Services (DHHS). National Center for Health Statistics. Third National Health and Nutrition Examination Survey, 1988–1994, NHANES III Laboratory Data File (CD-ROM). Public Use Data File Documentation Number 76200. Hyattsville, MD: Centers for Disease Control and Prevention, 1996
20. Ownby D Testing for latex allergy J Clin Immunoassay 1993,22 109–113
21. Slater J Latex sensitivity. Medscape Respiratory Care 1997,1:11–17
22. Yunginger JW, Jones RT, Fransway AF, et al Extractable latex allergens and proteins in disposable medical gloves and other rubber products J Allergy Clin Immunol 1994,93 836–842.
23. Williams PB, Buhr MP, Weber RW, et al Latex allergen in respirable particulate air pollution J Allergy Clin Immunol 1995,95 88–95
24. Miguel AG, Cass GR, Weiss J, et al Latex allergens in tire dust and airborne particles Environ Health Perspect 1996,104 1180–1186.
25. Petersen A, Vieths S, Aulepp H, et al Ubiquitous structures responsible for IgE cross-reactivity between fruit and grass pollen allergens J Allergy Clin Immunol 1996,98 805–815
26. Fuchs T, Spitzauer S, Vente C, et al Natural latex, grass pollen, and weed pollen share IgE epitopes J Allergy Clin Immunol 1997,100 356–364
27. Brehler R, Theissen U, Mohr C, et al "Latex-fruit syndrome" frequency of cross-reacting IgE antibodies Allergy 1997,52 404–410
28. Novembre E, Bernardini R, Brizzi I, et al. The prevalence of latex allergy in children seen in a university hospital allergy clinic Allergy 1997,52 101–105
29. Slater JE, Vedvick T, Arthur-Smith A, et al Identification, cloning, and sequence of a major allergen (Hev b 5) from natural rubber latex (Hevea brasiliensis). J Biol Chem 1996,271 25394–35399
30. Delbourg MF, Moneret-Vautrin DA, Guilloux L, et al Hypersensitivity to latex and Ficus benjamina allergens Ann Allergy Asthma Immunol 1995, 75 496–500.
31. Blanco C, Carrillo T, Castillo R, et al. Latex allergy: clinical features and cross-reactivity with fruits. Ann Allergy 1994;73:309–314
32. Valenta R, Kraft D. Type I allergic reactions to plant-derived food: a consequence of primary sensitization to pollen allergens. J Allergy Clin Immunol 1996,97.893–895.
33. Beezhold DH, Kostyal DA, Sussman GL IgE epitope analysis of the hevein preprotein, a major latex allergen Clin Exp Immunol 1997,108·114–121.

34. Gergen PJ, Turkeltaub PC, Kovar MG. The prevalence of allergic skin test reactivity to eight common aeroallergens in the U S population results from the second National Health and Nutrition Examination Survey. J Allergy Clin Immunol 1987,80 669–679.
35. Barbee RA, Kaltenborn W, Lebowitz MD, et al Longitudinal changes in allergen skin test reactivity in a community population sample J Allergy Clin Immunol 1987,79 16–24
36. Adkinson NF Jr, Thompson WL, Maddrey WC, et al. Routine use of penicillin allergy skin testing on an inpatient service N Engl J Med 1971,285 22–24.
37. Sogn D, Evans R, Shepard GM, et al. Results of the NIAID collaborative clinical trial to test the predictive value of skin testing with major and minor penicillin derivatives in hospitalized adults Arch Intern Med 1992,152 1025–1031
38. Golden DBK, Marsh DG, Kagey-Sobotka A, et al Epidemiology of insect venom sensitivity JAMA 1989; 262.240–244.
39. Lebenbom-Mansour MH, Oesterle JR, Ownby DR, et al. The incidence of latex sensitivity in ambulatory surgical patients–a correlation of historical factors with positive serum immunoglobin E levels Anesth Analgesia 1997; 85 44–49
40. Porri F, Lemiere C, Bimbaum J, et al Prevalence of latex sensitization in subjects attending health screening implications for a perioperative screening Clin Exp Allergy 1997,27 413–417.
41 Merrett TG, Merrett SRN, Kekwick R Prevalence of latex specific IcE antibodies in the UK Ann Allergy Asthma Immunol 1995,74 50–52.
42. Heese A, Peters KP, Koch HU. Type I allergies to latex and the aeroallergenic problem Eur J Surg 1997,579 19–22
43 Ebo DG, Stevens WJ, Bridts CH, et al Latex-specific IgE, skin testing, and lymphocyte transformation to latex in latex allergy. J Allergy Clin Immunol 1997,100 618–623

Requests for reprints should be addressed to
Dr Andrew Saxon,
Division of Clinical Immunology
Dept of Medicine,
UCLA Medical School,
Los Angeles, CA 90095-1680
email asaxon@mednet ucla edu



86th Congress, 2d Session } SENATE { Report No. 1163

HAZARDOUS SUBSTANCES FOR HOUSEHOLD USE

MARCH 10 (legislative day, FEBRUARY 8), 1960.—Ordered to be printed

Mr. MAGNUSON, from the Committee on Interstate and Foreign Commerce, submitted the following

REPORT

[To accompany S. 1283]

The Committee on Interstate and Foreign Commerce, to whom was referred the bill (S. 1283) to regulate the interstate distribution and sale of packages of hazardous substances intended or suitable for household use, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

1. THE PROBLEM

In a single year, your committee was informed, there are more than 200,000 poisonings in the United States, resulting in approximately 5,000 deaths, and the loss of over 80,000 man-years. Your committee was told there are over [illegible] common household products, such as furniture polish, bleaches, detergents, cleaners, etc., containing poisonous or dangerous substances that lack adequate warning labels, and adequate identification of the dangerous substance, information so necessary to the attending doctor in his efforts to aid his patient.

Further, we have been informed by the Public Health Service, that as the result of the recent national health survey, the Service estimates that 600,000 children under the age of 15 will swallow a poisonous or potentially poisonous substance each year.

The Federal Caustic Poison Act of 1927 (15 U.S.C. 401 et seq.) lists 12 chemical substances required to be labeled. It is outdated. Your committee hopes the Congress, by approving this bill, will broaden the protection given the public by the 1927 act.

2. IN GENERAL

In 1927 when Congress first required labels on caustic or corrosive substances conditions were considerably different than they are today. At that time there were only a few hazardous substances used to any

extent in and about the household. The development and introduction of many new substances during the postwar years for household use has created a public health problem. These substances are widely used and many are essential to the public. At the same time, the nature of a number of these new products, and the frequent introduction of new ones, has focused attention upon the need for warning the user, whenever the hazards in their use are significant. It is no longer possible to list, as did the Caustic Poison Act, chemical substances by name which should have precautionary labeling. At the same time, to be meaningful and to accomplish the purpose of this bill it is equally important that substances which, as packaged, present only a minor hazard not be required to display a series of precautionary statements, since the public might quickly learn to disregard the importance and significance of precautionary labeling.

The standards established in this bill for determining whether a substance is or is not a hazardous substance are those which are generally recognized at common law in civil liability cases relating to the seller's duty to warn users of the hazards of his products. Thus, substances to be regulated under this bill are carefully defined in the bill. These definitions are the result of meetings between industry groups, the Committee on Toxicology of the American Medical Association, representatives of the Department of Health, Education, and Welfare, and State public health officials who have recognized the need for and have supported legislation on this subject at the State level. In addition to those States having legislation, other States and some cities have adopted regulations to meet the same problem. The first States to adopt comprehensive legislation on this subject were the States of Texas, Kansas, Indiana, and Connecticut which enacted laws in 1957. The definitions in these State laws, which have had the benefit of 2 years of enforcement, are generally consistent with the definitions in this bill.

The testimony of the witnesses at the hearing on August 13, 1959, and letters and statements filed by various interested persons and groups, show a remarkable unanimity of support for the principle of this legislation. There appears to be no objection to this legislation and all suggestions and recommendations for amendments to S. 1283 have been considered by your committee.

3. Purpose of the Legislation

The primary purpose of this bill is to establish standards for the labeling of hazardous substances which are used in and about the household but which are not regulated by existing law. The Federal Caustic Poison Act which was enacted in 1927 lists 12 chemical substances which are required to be labeled, when such substances are in a container suitable for household use. This list of substances has been found by your committee to be inadequate in view of the numerous new chemical substances which are being sold for household use.

Economic poisons are regulated under and labeled in accordance with the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act of 1947, as amended. Foods, drugs, and cosmetics are subject to the provisions of the Food, Drug, and Cosmetic Act of 1938, as amended. Substances which are neither economic poisons nor foods, drugs, and cosmetics are not regulated with respect to pre-

cautionary labeling at the retail level except for the 12 chemicals listed in the [illegible].

In recent years [illegible] enacted in several States—Colorado, Connecticut, Illinois, Kansas, Ohio, Texas, and [illegible]—regulating the labeling of hazardous substances suitable for household use, many of which are shipped in interstate commerce. It is desirable that labeling of these substances be regulated when shipped in interstate commerce and that the standards and requirements of such labels be uniform. Thus, Federal legislation on this subject is needed to require uniform labeling of hazardous substances for household use to require that the labels of such substances: First, warn the user of any hazard in the customary use of the product; and, second, in case of an accident identify the hazardous ingredient for the attending physician.

4. Need for the Legislation

The need for this legislation was highlighted, your committee believes, by the testimony of Dr. Charles J. Savarese, Jr., director of the Suburban Hospital Poison Control Center, Bethesda, Md.

His testimony, given in open hearing, August 15, 1959, follows:

> Dr. Savarese. My name is Charles J. Savarese, Jr., M.D., residing at 3812 Old Spring Road, Kensington, Md. I am director of the Poison Control Center of Suburban Hospital, 8600 Old Georgetown Road, Bethesda, Md. The Poison Control Center of Suburban Hospital was established officially as of July 1, 1958, by the U.S. Public Health Service, and the Maryland State Department of Health.
>
> Dr. W. von Oettingen, on my right, is one of the foremost toxicologists in the country. He recently retired from the National Institutes of Health and he is now acting as our consultant.
>
> Primarily, poison control centers are designed for the use of physicians, as an information center where they may obtain the list of ingredients in various products, particularly household products, and the antidotes. A file is kept which is supplemented with additional items monthly by the National Clearinghouse of Poison Control Centers. Records [illegible] to the National Clearinghouse of Poison Control Centers. The cards are sent to the National Clearinghouse from each poison control center in order to disseminate the information. At present there are approximately 200 such centers in the United States and Canada.
>
> I appear before this committee today for only one purpose—that of a physician who is primarily concerned with the preservation of human life. Before becoming director of the new poison control center at Suburban Hospital, I gave only passing thought to the problems of household poisonings, simply lamenting the carelessness of parents when youngsters were brought to me suffering ill effects from having consumed some common household products. Now, because we have kept tab on [illegible] at our poison control center, and because of the [illegible] information made available to us through the National Clearinghouse, I realize it seldom was gross care-

lessness [illegible] nts but ignorance. Yes, I do not ignore [illegible] of people who are better educated [illegible] conditions in my [illegible] they are not [illegible] products that contain ingredients [illegible], particularly when consumed by young children.

There are over 300,000 common trade name items that contain poisonous materials, and the huge number of persons who are poisoned by them, the large percentage of them are children. Furniture polish, bleaches, detergents, pot cleaners, cosmetics, hair preparations—I could name an almost endless list of products such as these [indicating] commonly found in the average home within easy reach of children. I show you now but a few of the containers of poisonous materials from the 385 cases that we have collected in only 1 year's period of operation of our poison control center at Sub[illegible] Hospital. A substantial percentage of them are household products. Records such as these 385, which represent 1 year's work, are carefully kept at the center, and duplicates of these forms are forwarded to the national clearinghouse for analysis and statistical use.

You may wonder, "Why should a child consume some[illegible] testing as products such as these?" But, oddly enough, they do. In a single year, 1956, there were over 200,000 poisonings in this country, with 5,000 deaths, more than from all the so-called dread diseases such as scarlet fever, meningitis, polio, diphtheria, combined. Poisoning figures can be further dramatized by estimating that there are 89,761 man-years lost in a single year due to poisonings. Actually, there are 100 instances of poisonings suffered for every fatality from poisoning.

These figures are based on death certificates of the Public Health [illegible] and other reliable sources.

[illegible] the crying need for legislation to enforce uniform [illegible] of household products is becoming apparent to the physician, and the more enlightened public. You may question, "But a preschool child could not read the label." But his parents can and thereby will be warned. There has been widespread publicity on this subject. [illegible] magazine [illegible] Medical Profession, February 1958; the Saturday Evening Post, November 16, 1957; the New Yorker magazine, May 4, 1957; Hospitals magazine of the American Hospital Association; Look magazine; the Kiplinger magazine, Changing Times, July 1957; Health News of the New York State Department of Health, and many other publications. Coronet [illegible] issue of September 1955, in an article, "Household Chemicals That Kill," with the subtitle "Lax Laws, Carelessness, and Inadequate Labels Allow Poisonous Poisons To Endanger Your Family," had particularly [illegible] on the need for uniformity in labeling laws. [illegible] we have read on the subject of poisonings emphasizes this point to a strong degree.

... way at Suburban Hospital we are ... attempt to educate families to the perils that lurk in the kitchen, the bathroom, ... room and garage, as well ... the work environment. ... goes out regularly to our local newspapers, particularly those composed of young ... mothers, such as ... Invariably these young mothers express ... are appalled to learn of the large numerous ... products they are innocently harboring in their homes within reach of children.

We have distributed ... to the groups, to be put on suspected products and ... spring. ... Board of Education of Montgomery County, we distributed 7,500 leaflets at the pre-school conferences, warning mothers of kindergartners of the dangers in common household products. The Public Health nurses of our county have been thoroughly briefed by us on the subject. But the proportion of parents we reach is of course extremely limited.

Senator HARTKE. Let me ask you, Doctor, do you have a copy of the leaflet you ... ing of?

Dr. SAVARESE. Yes, ...

Senator HARTKE. We will make that a part of the record.

(The leaflet follows:)

KEEP OUT OF REACH OF CHILDREN

"SUBURBAN HOSPITAL

"POISON CONTROL CENTER

"... 6-6000

"DEAR PARENT: We want to talk to you about poison. In a single year 210,000 American youngsters were poisoned, and more than 5,000 of them died. Because of the increased number of accidental poisonings among children, particularly in the 1 to 4 age group, poison control centers have been set up throughout the country. Such a center was established last ... at Suburban Hospital in Bethesda, and in the first 9 months of operation, more than 225 cases of accidental poisoning have been treated and recorded at the hospital.

"Designed primarily as a service for physicians, the poison control center has on ... thousands of cards listing products that contain poisonous ingredients, giving their antidotes. The center is located in the emergency room of Suburban Hospital, and its service is available 24 hours a day.

"For ... there are many thousands of products on the ... containing harmful ingredients. No physician could possibly carry all the information in his mind. In the event that your child has swallowed something you suspect may be harmful, ... your physician immediately, or—if you cannot reach ... take your child to the nearest hospital, taking the container with you. The facilities of the ... control center are available to determine the ... of the material.

"[illegible] PARENTS

"It's natural for a young child to put everything in his mouth. Unfortunately many common household items don't have warning labels, but are very dangerous. Your home probably has some of these potential poisons:

"Medicines (particularly aspirin and candy-flavored medications).

"Petroleum products (kerosene, lighter fluid, furniture polish).

"Paint remover (including turpentine).

"Detergents and laundry bleaches.

"Cosmetics (hair lotions, shampoos, nail preparations, perfumes).

"Insecticides.

"'OUT OF REACH—OUT OF SIGHT—KEEPS YOUR CHILD OUT OF TROUBLE'

"Check your home, especially the kitchen, the bathroom, the basement. Keep all potentially harmful products out of reach of children.

"Lock up all suspected items. Store potentially harmful household products on high shelves.

"Do not store things in unlabeled bottles or containers that originally had another use—particularly not in drinking cups or pop bottles.

"Never sell a child on the idea of taking medicine by telling him it is candy. Aspirin is dangerous—12 tablets can be fatal to a small child.

"In administering medicine read labels three times, in a good light. Never administer or take medicines in the dark. Place bottles on stable surfaces out of reach of children. Throw away special medications after the patient has recovered."

Poisoning is the most common medical emergency among children. Accidental poisonings account for 43 percent of all deaths among children between the ages of 2 and 3. Realizing this, physicians are greatly alarmed at the increasing number of products appearing on the market that contain toxic ingredients and are in no way labeled as to content and toxicity. We physicians who act as heads of poison control centers keep pleading with manufacturers of these household items that contain potential poison to be a bit more open and informative in the labeling.

Some producers of these items are reluctant to label their product "Poison" when it isn't outright poison. They do not want to use the old skull and crossbones insignia on labels because it lowers their sales, is their argument. Some will not indicate a harmful ingredient "for fear of giving away the formula." Some will tell the buyer that a certain polish, cleaning fluid, or cosmetic "may be fatal if inhaled or swallowed," but will print this in the tiniest type which few users ever read. Many do not even have a warning label.

At present [illegible] a manufacturer of household and [illegible] list the ingredients in these produc[illegible] on the label. When [illegible] recently sick, com[illegible]ing, sometimes hours are spent trying to track down [illegible]turer to learn what is in the new cleanser, or anti-[illegible]d, so that possible treatment may be administered. Often the police are called upon to help locate the manufacturer of some new lethal household liquid or paste. There is strong evidence that the toxicity of common household products is not widely recognized; hence many parents delay hours, even days, in seeking treatment for children whom they know have swallowed household products.

The most [illegible] and sad fact is that each of these many de[illegible] illnesses is capable of being prevented. Literally hundreds of thousands of poisonings need not have occurred. Unless we get legislation in this country leading to uniformity in labeling household [illegible] toxic content, these tragic poisonings will continue [illegible] use.

Gentlemen, I [illegible] this opportunity to appear before this committee to present you with a few of the facts of the poisoning picture, facts which are overwhelmingly substantiated through the national clearinghouse for poison control centers which act under the U.S. Department of Health, Education, and Welfare. I feel that, as a typical poison control center director, I speak for all such directors when I assure you [illegible] earnest desire to see legislation enacted that [illegible] these tragic, unnecessary poisonings [illegible] tion that will create a fair and uniform labeling act for household and commercial products.

Thank you for permitting me to appear.

Senator HARTKE. Doctor, I want to say that this is shocking to me. I am really surprised to find children 2 and 3, which I do not [illegible] time—may have shortly again—but [illegible] The youngest one is 5, but if I were [illegible] en 2 and 3, realizing that 43 perce[illegible] [illegible] children is caused by accidental poisoning, I think I would be up in arms, too, about this thing.

I want to commend you for your fine statement. You [illegible] reference here to innocent ignorance. I would say not only is that a dangerous thing in the medical field, it is also a dangerous thing in Government.

Thank you.

Dr. S[illegible]

[illegible] IENTS

[illegible] the hearings on this le[illegible]lation, many amendments [illegible], both by industry and Government witnesses. In addition, [illegible]artment of Health, Education, and Welfare submitted, [illegible]

... closed, a suggested title II, which ... a the Food, Drug, and Cosmetic Act. With respect to ... committee believes this proposal should be the subject of ... legislation.

The other suggested changes in the bill were adopted by your committee. This was accomplished by striking all after the enacting clause and ... bill.

Following is a section-by-section comparison of the bill as introduced, and as it was reported by your committee:

Section 1 and section 2 (a) through (e) are unchanged.

Section 2(f), which defines "hazardous substance", was expanded at the suggestion of industry and the Department of Health, Education, and Welfare so as to cover injury or illness resulting from any ... ably foreseeable ... handling, allow the Secretary of Health, Education, and Welfare ... necessary regulations declaring a substance to be ... that meets the definition of "hazardous substance," and to grant certain exemptions from the bill.

Section 2(g) was amended to exempt radioactive substances from the definition of "toxic" since they are covered by section 2(i). Other changes in this subsection are for clarifying purposes.

Section 2(h) had added to it the words "or two milligrams per liter by volume or less" ... to give a measuring standard for mists or dusts.

Subsections ... are unchanged.

Section 2(k) was amended to require the Secretary, before he designates a substance as a strong sensitizer, to find that such substance has a significant potential for causing hypersensitivity.

Section 2(l) was amended to provide a standard for testing the flammability of solids.

Section 2(m) is new and defines "radioactive substance" ... stance ... emits ionizing radiation.

Section ... 2(m) of the original bill) was amended ... that "label" ... * * * matter upon the immediate ... * * *" ... * matter upon or attached to the ... package or containers ... * *".

Section 2(o) is identical with subsection (n) in the original ...

Section 2(p) (old subsection (o)) detailed laboratory tests ... stances before they could be labeled with signal words such as ... Since such tests are detailed in other sections of the bill, the ... deleted from this subsection, and the Secretary was granted authority to modify ... the labeling requirements.

Section ... grants the Secretary authority, by regulation, to declare ... "hazardous substance." Procedures ... public hearing ... review are contained in the amendment. This subsection also would authorize exemptions from this ... if public health and safety are adequately protected.

PROHIBITED ACTS

Section 4, is old section 3, and is unchanged through sub...

Subsection (e) is amended to permit access to and copying ...

Subsection (f) bars the reuse of containers which bear the ... markings. It was rewritten for purposes of clarity.

Subsection (g) is new and would prohibit the manufacture ... hazardous sub... is not branded.

Subsection (d) is new, and would protect information such as trade secrets [illegible] any manner under this bill.

[illegible]lies," is old section 4. The old section provided [illegible] misdemeanors subject to a fine of not more than [illegible] subsequent violations would be subject to imprisonment up to 1 year [illegible] than $3,000, or both.

The amendment would make [illegible] fine of not more than $500, or imprisonment of not more than 90 days, or both, and add to the second or subsequent offenses any offense committed with intent to defraud or mislead. The amendment also clarified the exemption of packages [illegible] for export.

Section 6, "Seizures," is old section 5. Substances in reused containers and hazardous substances that are misbranded were added to this section.

Section 7, of [illegible] section 6, is unchanged.

Section 8, "Injunctions," is new, and would authorize Federal courts to enjoin or restrain violations of this legislation.

Section 9 is also new, and would authorize the issuance of subpenas in the enforcement of this legislation.

Section 10 is old section 7 unchanged.

Section 11, "Examinations and Investigations," is old section 8. It was amended to cover all pertinent finished and unfinished hazardous substances, labeling, and the obtaining of samples. Receipts must be given for samples, and if analyzed, a copy of the analysis supplied.

Section 12, "Records of Interstate Shipment," is old section 9, and the amendment is the second proviso that would exempt carriers from this legislation if they were acting in the normal course of their business as carriers.

Section 13, old section [illegible] unchanged.

Section 14, "[illegible]," is old section 11. The amendment extended this section to cover the use of used packages.

Section 15 is old section 12 unchanged.

Section 16, "Time of Taking Effect," is old section 13. The amendment would allow the Secretary to extend the effective date of the bill, or parts of it, to not more than 18 months after enactment.

Section 17 is old [illegible] was expanded to cover parts of the Interstate Commerce [illegible] Public Health Service Act, etc., all at the suggestion of the Department of Health, Education, and Welfare.

Section 18, old section 15, was amendment to bring the repeal of the [illegible] Caustic Poison Act in line with the authority in section 16 to extend the effective date of this legislation.

6. Section-by-Section Analysis of the Amended Bill

This bill first [illegible] substance and would provide that any hazardous [illegible] container, intended or suitable for household use, which is not labeled in accordance with the requirements of the bill, would be deemed to be a misbranded package [illegible] packages would be subject to seizure and condemnation [illegible] penalties are provided for failure to comply with [illegible] requirements.

Provision is made for the Secretary of Health, Education, and Welfare to adopt regulations for the effective enforcement of the bill, including the authority to declare a substance to be a hazardous substance if the Secretary finds that such substance would meet the definition of a hazardous substance but for the fact that adequate information of the hazardous nature of the substance or its application. The Secretary would also be authorized to establish reasonable variations, or additional or less stringent labeling requirements, if he found them necessary for the protection of the public health and safety.

Economic poisons subject to the Federal Insecticide, Fungicide and Rodenticide Act, and foods, drugs, and cosmetics subject to the Federal Food, Drug and Cosmetic Act would be exempt from the definition of hazardous substance, since these substances are already regulated by Federal legislation.

This bill would require that the label of any hazardous substance in a container intended or suitable for household use show the name and address of the manufacturer, packer, or seller, the name of the hazardous ingredient; a signal word, "Danger," "Warning," or "Caution"; a statement of the hazard; a statement of the precautionary measures; when necessary or appropriate instructions for first-aid treatment; the word "poison" on any substance defined as "highly toxic"; instructions for handling or storage of packages which require special care in handling or storage and the statement "*Keep out of the reach of children*" or its practical equivalent.

Since most reported cases of injury or illness from the use of hazardous substances involve young children, a statement, such as "Keep out of the reach of children," or its practical equivalent in light of the nature of the particular hazard, is an important requirement of this bill.

7. Explanation of the Amended Bill by Sections

Section 1

This section gives the title of the bill which will be cited as the "Federal Hazardous Substances Labeling Act."

Section 2

This section defines "hazardous substance" and the terms which are used in this definition; "toxic," "corrosive," "irritant," "sensitizer," and "flammable." An additional category of hazard, "generates pressure through decomposition, heat, or other means," is not further defined since its essential meaning is clear. The term "highly toxic" is also defined and will determine those substances on which the word "poison" must be used.

It is intended that the definition of a hazardous substance be limited to those substances which, as packaged, may cause substantial personal injury or substantial illness during or as the result of any customary or reasonably foreseeable handling or use. This includes ingestion by children where it is reasonably foreseeable (and the bill recognizes that it is often foreseeable). It is also intended by these definitions to draw as sharp a line of distinction as possible between the substances covered by the bill and the substances which are unaffected by it, employing the

guage of the common law of civil liability in drawing such a line. In order to insure that the definitions will include all substances which should be within the scope of the bill, these definitions are broad in scope. They are not intended, however, to include substances where the hazard is minor taking into account on the one hand the risk or chance of injury and on the other hand the degree of injury probable or possible in case of accidental or intentional misuse.

It is recognized that any substance used in or about the household can cause some degree of injury or illness if accidentally or intentionally misused. It is the purpose of this bill to require precautionary labeling which is meaningful and will be observed by the user, but not to require labeling on so many of the things that go into a household as to invite carelessness and the ignoring of precautionary statements on substances which present substantial hazards.

The term "highly toxic" is defined in terms of specific laboratory tests with a provision that the Secretary should give precedence to any data on the use of these substances from human experience, if such experience indicates results different from those obtained on animals in these tests. The term "irritant" is defined as one which will induce a local inflammatory reaction on the skin. It is recognized that immersing the hands in water and other mild liquids for extended periods of time will cause irritation of the skin. Precautionary labeling, however, would be required only on those substances which under conditions of customary or reasonably anticipated handling or use will induce a substantial "local inflammatory reaction" as that term is defined and used by the medical profession.

The term "strong sensitizer" is defined and would require a finding by the Secretary that a substance is a strong sensitizer within the meaning of the bill before such substances would be subject to the law. Some portion of the population is sensitive in one way or another to almost every article that enters the household, including foods and household soap. To require precautionary labeling on all such products is not intended. Precautionary labeling would be required under this bill on any substance which affects a significant portion of the population and which may cause a strong or severe reaction, if after a finding by the Secretary that the substance had a significant potential for causing hypersensitivity.

The term "misbranded package" would be defined as one containing a hazardous substance, as that term is defined, in a container intended or suitable for household use, unless the container bears a label stating (1) the name and place of business of the manufacturer, packer, distributor, or seller; (2) the name of the hazardous ingredient; (3) the signal word "Danger" on substances which are extremely flammable, corrosive, or highly toxic; (4) the signal word "Warning" or "Caution" on all other hazardous substances subject to the bill; (5) an affirmative statement of the principal hazard, such as "Flammable, Vapor Harmful"; (6) precautionary measures to be taken except when modified by regulation of the Secretary; (7) instructions for first aid treatment, when necessary or appropriate; (8) the word "Poison" for substances defined as "highly toxic"; (9) instructions for handling and storage of packages which require special care in handling or storage; and (10) the statement "Keep out of the reach of children" or its practical equivalent; for example, "Keep out of the reach of infants," where the products can be properly used by older children. These

statements would ... ntly on the label and ... d legible type, and ... the English lange... ... graphy, ... other printed matter on the label.

... would authorize the Secretary to issue regulations for ... enforcement of the legislation. The Secretary would be authorized, when in his judgment such action would promote the objectives of the act by avoiding or resolving uncertainty as to its application, to declare substances to be subject to the act if he found that such substance meet ... in section 2. It is intended in making such a fi... guided by principles of the common law with re... by a seller to warn of the hazards of his products. The Secretary would be also authorized to establish reasonable ... ions or additional labeling requirements, in view of the special hazard presented by any particular hazardous substance, ... finds necessary for the protection of the public health and ...ety. The Secretary would also be authorized to permit less than full compliance with the labeling requirements ... bill when such is not necess... ...uate protection of the public health and safety. Th... provide that proceedings for ...ing, amending, ...tions shall be covered by pertinent procedural s... ...l, Drug, and Cosmetic Act.

Section 4

This section specifies the prohibited acts, which include the introduction and delivery into interstate commerce of any misbranded or ... hazardous substance; the alteration, mutilation, destruction, ... removal of any part of a label of a hazardous substance; and would make unlawful the failure to permit entry or inspection of a factory or plant in which hazardous substances are manufactured ... stored. This section would also prohibit the giving of a false ... tee that the lab... ...stance is in compliance with the ... lation, and would ... of any container labeled or ... ...ner or the re...se of a food, drug, or cosmetic cont... ... as such.

Section 5

This section specifies the penalties for violation of any ... ...bited acts set forth in section 4, and would provide a pen... ... of not more than $500 or imprisonment of not more than ... days for each offense, but for second and subsequent offenses or for an offense committed with an attempt to defraud or mislead, a penalty of imprisonment of not more than 1 year or a fine of not more than $3,000 or ... is provided.

Section 6

This ... procedure for the seizure and condemnation of ... hazardous substance subject to this bill which is not labeled in compliance therewith.

Section 7

This section requires the Secretary to give any person ... be heard prior to the institution of a criminal ... for failing to comply with the prohibited acts set forth in ...

Section

Th[illegible] the U.S. district courts and the cour[illegible] injunctions to restrain violations of this act.

Section 9

This section specifies the [illegible] of enforcement proceedings and would authorize subpenas for witnesses to be served in any district in the United States.

Section 10

This section would authorize the Secretary of the Treasury and the Secretary of Health, Education, and Welfare to prescribe regulations with respect to imports of hazardous substances, and would authorize the Secretary of Health, Education, and Welfare to promulgate regulations for the efficient enforcement of this act. This bill contemplates that such regulations would be made in the manner prescribed in section 4 of the Administrative Procedure Act. It is intended that public hearings should be held on important regulations and that a minimum of [illegible] should be allowed for the submission of views by interested persons before the adoption of a proposed regulation as final.

Section 11

This section would authorize entry and inspection of any factory, warehouse, establishment, or vehicle, and of pertinent finished and unfinished [illegible] hazardous substances and labeling therein. Inspection of unfinished hazardous substances would ordinarily be limited to those few cases where the needed information was not readily available from inspection of the finished hazardous substance. The inspection must be conducted at reasonable times and within reasonable limits and in a reasonable manner, and must be commenced and completed with reasonable promptness.

The section would also authorize [illegible] taking of samples of the hazardous substance or [illegible] packages thereof and would require that a receipt [illegible] samples obtained. In addition, if an analysis is made [illegible] results must be furnished promptly to the owner, operator, or agent in charge.

Section 12

This section would require carriers and others receiving hazardous substances to permit access to and copying of any record of a shipment of hazardous substances, would provide that any evidence obtained under this section shall not be used in a criminal prosecution of the person from whom the evidence is obtained, and exempt carriers from the act if they [illegible] handling the hazardous substance in the usual course of business as carriers.

Section 13

This section would authorize the Secretary to publish any judgments, decrees, or court orders rendered under this act and to disseminate information regarding hazardous substances in situations involving imminent danger to health.

Section 14

[illegible] the importation of hazardous substances and [illegible] substances be labeled in compliance with this act.

Section 15

This section would provide for the separability of any provision of this bill which may be declared unconstitutional or invalid.

Section 16

This section would provide that this bill shall take effect upon its enactment, but provides that no penalty shall be enforced for a period of 6 months after enactment. It would authorize the Secretary to extend the effective date for penalties for a period of not more than 18 months upon a finding that conditions exist which necessitate prescribing of such additional period or periods of time.

Section 17

This section specifies the application of this bill to existing law.

Section 18

This section provides for the repeal of the Federal Caustic Poison Act but preserves any proceedings for violation of the Federal Caustic Poison Act committed prior to the effective date of this bill.

8. Conclusion

The principle of this bill has been endorsed by industry, the American Medical Association, and the various governmental departments. Your committee urges the approval of the bill as reported.

Agency Comment

The Civil Aeronautics Board, the General Services Administration, the Department of the Interior, and the Department of the Treasury had no comments or recommendations to offer. The Department of Agriculture, the Department of the Army speaking for the Defense Department, the Federal Aviation Agency, the General Accounting Office, the Panama Canal Company, and the Department of State had no objection to the enactment of the bill.

The Atomic Energy Commission, the Department of Health, Education, and Welfare, the Interstate Commerce Commission, and the Post Office Department suggested amendments which were adopted by your committee. The Federal Trade Commission suggested an amendment which was not adopted, since it appeared existing law was clear on the point raised.

The letters follow.

U.S. Department of Agriculture,
Washington, D.C., August 12, 1959.

Hon. Warren G. Magnuson,
Chairman, Committee on Interstate and Foreign Commerce,
U.S. Senate.

Dear Senator Magnuson: This is in reply to your request of March 9, for a report on S. 1283, a bill to regulate the interstate

[illegible] hazardous substances intended or

[illegible] ctment of S. 1283 from the standpoint of the ac[illegible]nt.

The bill would [illegible]ling of hazardous substances not now cover[illegible] exempt economic poisons subject to the [illegible]ngicide, and Rodenticide Act, and foods, drugs, and cosmetics subject to the Federal Food, Drug, [illegible]tic Act. The bill is restricted to hazardous substances [illegible]able for household use. Among the terms defined in the bill are "toxic" and "highly toxic." For the latter term it sets arbitrary laboratory limits for each category by oral, skin, and inhalation routes of intake. It would permit the substitution of human data for animal data, and stipulates that when the former is available, it shall take precedence. In addition, the bill sets penalties for violation and provides [illegible] of misbranded packages except those intended for export and in accordance with the laws of the foreign country. It provides for the promulgation of regulations by the Secretary of Health, Education, and Welfare, for examinations and investigations, and for inspection of records of interstate shipments. Also, the bill covers imports, carries the usual separability clauses, and stipulates that it shall take effect on the date of enactment but that no penalty or condemnation shall be enforced for 6 months thereafter. The Federal Caustic Poisons Act would be repealed.

[illegible]ould not conflict with this Department's administration of the Federal Insecticide, Fungicide, and Rodenticide Act. The definition of "highly toxic" closely in line with those in the regulations under that act. [illegible] of "toxic," while not as close to the interpretations [illegible] Insecticide, Fungicide and Rodenticide Act [illegible] is up to date and realistic.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely yours,

E. L. Peterson, *Acting Secretary.*

U.S. Atomic Energy Commission,
Washington, D.C., August 20, 1959.

Hon. Warren G. Magnuson,
Chairman, Committee on Interstate and Foreign Commerce,
U.S. Senate.

Dear Senator Magnuson: This letter is in reply to your request for the Commission's comments on S. 1283, a bill to regulate the interstate distribution and sale of packages of hazardous substances intended or suitable for household use.

By far the greatest volume of radioactive material which is in commercial or other use in this country is source, special nuclear, or by-product material subject to the regulations of the Atomic Energy Commission pursuant to the Atomic Energy Act of 1954, as amended. The act established a comprehensive system of regulatory control by the Atomic Energy Commission over such materials in order to protect health and safety and the common defense and security. Except as

very small quantities of source material ... regulations, the pos... transfer of such material ... a license from the C... unlawful; and licensees are ... to observe such ... as may be issued by the Commission in-o:

In ... under the Atomic ... has issued a number of regulations ... and safety, which apply to the possession and use of source, byproduct, and special nuclear material These regulations include part 20 "Standards for Protection Against Radiation"; part 30 "Licensing of Byproduct Material"; part 40 "Control of Source Material"; part 50 "Licensing of Production and Utilization Facilities"; part 70 "Special Nuclear Material"; and part 71 "Protection Against Accidental Conditions of Criticality in the Shipment of Special Nuclear material." Copies are enclosed. Other regulations are in course ...

The Commission ... has established detailed requirements and criteria for the issuance of licenses; and permit the use of licensed materials only for such uses as the Commission has found by regulation or in the applicable license to be consistent with health and safety. Appropriate labeling of articles containing source, byproduct and special nuclear material is required. Exceptions from labeling requirements are contained in part 20 only for exceedingly small quantities of such materials.

Basically, the Commission's regulations require that—

1. Each licensee or his staff must have suitable training or experience to ... and use the material or facility safely for the pur... is requested;

2. The ... and operating procedures must be adequate to protect health and minimize danger to life and property;

3. The location of the proposed use must be suitable for the purpose;

4. He may use the material or facility ... for ... authorized in his license;

5. He may not transfer the material or facility except to a person authorized to receive it an may not dispose of radioactive material except as authorized.

Exemptions from specific licensing requirements are provided ... for the very ... of byproduct material specified ... tities of source material. Depending ... tion 30.72 an... ivity, periodic inspections of licensees ... on the nature of ... are made to assure ... compliance with the Commission's requirements and to determine whether previously unforeseen hazards may arise.

The Commission has authorized the introduction of byproduct material into product intended for household use only if authorized in a specific license issued pursuant to section 30.71. Under that section the Commission has authorized the introduction of byproduct material into the four types of devices specified in that section, namely, static elimination devices, spark gap and electronic tubes, ... and ion generating tubes. It should be emphasized that ...

effective only wi[illegible]evices contain not more tha[illegible] of byproduct [illegible] in the section and then [illegible] vice has been "manufa[illegible] and labeled b[illegible] in accordance with the specifications contained in [illegible] to him pursuant to the regulations * * *.

The quan[illegible] of source material permitted without [illegible] and the quantities of byproduct material permitted unde[illegible] are not large enough to [illegible] their introduction on a significant scale into household products [illegible] license from the Commission. In addition, persons [illegible] product material under a general license may not administer such material to human being or add it to any food, beverage, cosmetic, or drug, or include it in any device in[illegible] in the treatment of human beings or animals. [illegible] Commission's extensive authority under the Atomic [illegible] 1954 and the comprehensive scope of its regulatory program to protect against hazards to health and safety arising out of the possession, use, and transfer of byproduct, source, and special nuclear material, the Co[illegible] no purpose which would be served by including [illegible] the scope of the bil[illegible] Indeed, the bill woul[illegible] respect to substances which "may cause substant[illegible] or illness during any [illegible] reasonably anticipated handling or use" (sec. 2(f)[illegible] the Commission would not under such circumstances authorize the introduction of byproduct, source, or special nuclear material into household products.

In view of the fact that the Commission is presently exercising far more extensive controls with respect to source, byproduct, and special nuclear material to protect health and safety than would be provided in S. 1283 with respect [illegible], we urge that [illegible] be exempted from the [illegible]ill. For this purpose, we suggest that the follo[illegible]d of subsection 2(f) S. 1283: "the term [illegible] shall not include any so[illegible] material, or byproduct material as defined [illegible] of 1954, as amended, and regulations [illegible] thereto by the Atomic Energy Commission."

Sincerely yours,

A. R. LUEDECKE, *General Mana[illegible]*

CIVIL AERONAUTICS BOARD,
Washington, D.C., April 2, 1958.

Hon. WARREN G. M[illegible]
Chairman, Committee on [illegible] and Foreign Commerce,
U.S. Senate, Washington, D.C.

DEAR SENATOR MAGNUSON: This is in reply to your letter of March [illegible], asking the Board for comment on S. 1283, a bill to regulate the interstate distribution and sale of packages of hazardous substances intended or suitable for household use.

The proposed legislation has no significant bearing on matters coming before the Board and we have no comment to make on it.

Sincerely yours,

CHAN GURNEY, *Vice Chairman.*

DEFENSE DEPARTMENT,
DEPARTMENT OF THE ARMY,
Washington, D.C., August 12, 1959.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
U.S. Senate.

DEAR MR. CHAIRMAN: Reference is made to your request to the Secretary of Defense for the views of the Department of Defense with respect to S. 1283, 86th Congress, a bill to regulate the interstate distribution and sale of packages of hazardous substances intended or suitable for household use. The Secretary of Defense has delegated to the Department of the Army the responsibility for expressing the views of the Department of Defense thereon.

The purpose of the bill is stated in the title.

The Department of the Army on behalf of the Department of Defense interposes no objection to the above-mentioned bill, since it is intended to regulate and control the proper labeling of hazardous substances at the manufacturing and distribution level.

This report has been coordinated within the Department of Defense in accordance with procedures prescribed by the Secretary of Defense.

The enactment of this legislation will cause no apparent increase in the budgetary requirements for the Department of Defense.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely yours,

(Signed) HUGH M. MILTON II,
Acting Secretary of the Army.

FEDERAL AVIATION AGENCY,
Washington, D.C., August 18, 1959.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
United States Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This will answer your request of March 9, 1959, for a report on S. 1283, a bill to regulate the interstate distribution and sale of packages of hazardous substances intended or suitable for household use.

The purpose of this legislation is to permit the Department of Health, Education, and Welfare to carefully regulate the distribution and sale of hazardous substances intended or suitable for household use. The bill defines such substances, makes provision for their careful labeling, prohibits certain harmful practices with regard to them, authorizes seizure under certain conditions, and provides penalties for violations of any of its provisions.

The Federal Aviation Agency has reviewed S. 1283 and has no objection to it from an aeronautical safety viewpoint. It is noted that section 14 of the bill provides that it shall not be construed to modify or affect the provisions of section 902 of the Federal Aviation Act of 1958 or the regulations promulgated under section 601 of that act.

The Bureau of the Budget has advised that it would have no objection to the submission of the report to the committee.

Sincerely,

E. R. QUESADA, *Administrator.*

COMMISSION,
THE CHAIRMAN,
Washington, August 11, 1959.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: By your letter of March 9, 1959, you requested comments on S. [illegible] Congress, 1st session, a bill to regulate the interstate distribution and sale of packages of hazardous substances intended or suitable for household use.

This bill would require certain specific labeling of packages or containers of hazardous substances defined in the bill. Criminal penalties are provided for violation. Misbranded packages of hazardous substances could be seized and condemned. The bill would give authority to the Secretary of Health, Education, and Welfare to issue regulations, hold hearings, make examinations and investigations, inspect records and disseminate information publicly. A special provision applies to imports. The bill would repeal the Federal Caustic Poison Act but contains a provision (sec. 14) that nothing contained in the bill shall be construed to modify certain other statutory provisions relating to [illegible].

While the [illegible] of the proposal appear to be in the public interest, the [illegible] directly affect any of the powers or responsibilities of the Federal Trade Commission and we have no special knowledge or experience by which to evaluate any of the particular provisions.

Section 2(1) of the bill contains definitions of "extremely flammable" and "flammable," which are applicable to liquids. Section 4(a) of the Flammable Fabrics Act (15 U.S.C. 1193), which the Commission administers, contains a standard of [illegible]lity for fabrics and articles of wearing apparel. Although the Flammable Fabrics Act standard of flammability and the definitions contained in section 2(1) of the bill do not apply to the same subject matter, in order to avoid any [illegible] of confusion, you may wish to include a reference to the Flammable Fabrics Act in the section 14 listing of laws not affected by the bill.

By direction of [illegible]

EARL W. KINTNER, *Chairman.*

N.B.—Pursuant to regulations, this report was submitted to the Bureau of the Budget on March 27, 1959, and on August 11, 1959, the Commission was advised that there would be no objection to the submission of the report to the committee.

ROBERT M. PARRISH, *Secretary*

GENERAL ACCOUNTING OFFICE,
COMPTROLLER GENERAL OF THE UNITED STATES,
Washington, March 12, 1959.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
U.S. Senate.

DEAR MR. CHAIRMAN: Your letter of March 6, 1959, requ[illegible] comments on S. 1283, 86th Congress, which is a bill to regulate [illegible] interstate distribution and sale of packages of hazardous subst[illegible] intended or suitable for household use.

... the provisions of the bill would not affect ... ance and we have no special information bearing upon the ma... offer no objection to the measure or ... concerning its ... ment.

This report is submitted in triplicate, as requested.

Sincerely yours,

JOSEPH CAMPBELL,
Comptroller General of the United States.

... SERVICES ADMINISTRATION,
Washington, D.C., July 6, 1959.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: Your letter of March 9, 1959, requests comments on the following proposed legislation:

S. 1269, a bill authorizing the construction by the Maritime Administration of 30 merchant vessels of appropriate types

S. 1283, a bill to regulate the interstate distribution and sale of packages of hazardous substances intended or suitable for household use.

S. 1269 relates to the need for additional merchant vessels in order to more effectively ... t the national policy expressed in section 101 of the Merch... ... t of 1936.

S. 1283 relates to ... of interstate distribution and ... le of hazardous substances ... or suitable for household use.

Under its statute (63 Stat. 383; ... 181), GSA is interested in transportation and traffic management as a user of transportation services. Therefore, it would not directly be affected by the proposed legislation.

Accordingly, S. 1269 and S. 1283 do not sufficiently concern GSA's ... sion to warrant an expression of opinion.

The Bureau of the Budget has advised that they have no ob... to the submissi... ... t to your committee.

Sincerely ...

FRANKLIN FLOETL, *Admini...*

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
August 12, 1959.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This letter is in response to your request of March 9, 1959, for a report on S. 1283, a bill to regulate the interstate distribution and sale of packages of hazardous substances intended ... suitable for household use.

The bill, to be known as the Federal Hazardous Substances ... Act, is designed ... informative labeling on packages ... ous substances ... suitable for household use.

[illegible] "hazardous substance" so as to include [illegible] below, the various substances that have caused, or [illegible] most likely to cause, serious injuries in the home when they are distributed without adequate precautionary labeling. Foods, drugs, and cosmetics subject to the Federal Food, Drug, and Cosmetic Act and "economic poisons" covered by the Federal Insecticide, Fungicide, and Rodenticide Act would, however, be excluded from the act.

Among other things, the bill would deem a package of a hazardous substance, intended or suitable for household use, to be a "misbranded package" unless it bears an appropriate signal word—such as "Danger," "Caution," or "Warning"—together with specific information warning the consumer that he is dealing with a material which presents a special hazard, instructions about how to use it safely, a warning to keep it out of the reach of children, and in certain cases instructions for first-aid treatment in case of injury. The Secretary of this Department would be required to prescribe minimum label information for "small packages" in place of the statutory requirements, and would further be authorized to provide for less than the statutory label requirements in the case of substances presenting only minor hazards.

The bill would prohibit the introduction or delivery for introduction into interstate commerce of a misbranded package of a hazardous substance; the receipt in interstate commerce, and delivery or proffered delivery, of such a misbranded package; the alteration or destruction of the label or doing of any other act which causes a hazardous substance, while in interstate commerce or while held for sale after shipment in interstate commerce to be in a misbranded package; and the use of a used food, drug, or cosmetic container, identifiable as such, as a container for a hazardous substance.

The scope of the bill is broadened by the bill's definition of "interstate commerce" which, like the Federal Food, Drug, and Cosmetic Act, defines that term to include (1) commerce between any State or territory and any place outside thereof, and (2) commerce within the District of Columbia or any other territory not organized with a legislative body.

Violation of the law would be a misdemeanor subject to a $500 fine or, in the case of a second or subsequent offense, to imprisonment for not more than 1 year or a fine of not more than $3,000, or both. Hazardous substances in misbranded packages while in interstate commerce, or while held for sale after shipment in such commerce, would be subject to judicial seizure and condemnation.

The Secretary would have authority to issue regulations for the efficient enforcement of the law, to conduct examinations and investigations, and to issue publicity about his enforcement of the law. The Secretary also would be authorized to disseminate information regarding hazardous substances that involve imminent danger to health.

A provision for enforcement of the act with respect to importations of packages of hazardous substances is included in the bill. Articles intended and labeled for export would be exempted from seizure and from giving rise to penalties if labeled in accordance with the laws of the country of destination and the specifications of the foreign purchaser.

69002°—60 S. Rept. 86 [illegible] vol 2——3

The Federal Caustic Poison Act (15 U.S.C. 401 et seq.) would be repealed because the proposed bill would supplant it.

There is great need for legislation requiring better labeling of poisonous and hazardous materials that are brought into the home. The Federal Caustic Poison Act, enacted in 1927, requires informative labeling of a few poisonous chemicals that were primarily responsible for home poisonings and related accidents when it was enacted. That act has saved many lives, but it is not applicable to many other poisons that commonly find their way into homes today.

For example, a number of household silver polishes contain deadly cyanide, and over the years a number of deaths have been caused by the ingestion of such polish by children; a number of household dry-cleaning preparations contain carbon tetrachloride, a potent liver poison that may cause serious injury or even death if used without adequate ventilation. Numerous other chemicals not covered by the Federal Caustic Poison Act are capable of causing, and have caused, tragic accidents when used in the home improperly. The bill is intended to require the labels of such hazardous articles to provide householders and their families with adequate instructions for safe use of the materials and to provide, when necessary, adequate first-aid instructions for treatment of such injuries as occur.

We strongly favor the objective of the bill, and, subject to a number of needed modifications of the bill, urge its favorable consideration by your committee.

In order to improve, strengthen, and facilitate enforcement of the bill, we believe it essential, however, that it be amended in certain respects. The principal improvements needed are summarized below:

1. Enforcement

(*a*) *Factory inspection.*—While the bill would authorize our inspectors to enter establishments in which hazardous substances are held for, or after, introduction into interstate commerce, and any vehicle used to transport or hold such substances in interstate commerce, it would allow us to inspect and sample only finished hazardous substances already in retail packages, and the labeling thereon. This limitation would make the factory inspection provision virtually meaningless—since our inspectors could purchase the finished packaged articles in retail stores without any inspection authority—and would withhold from us an administrative tool which we regard as vital to the efficient and economical enforcement of the bill.

We believe that, in order to administer the bill successfully, we must have inspection authority at least as broad as that conferred upon us by the Federal Food, Drug, and Cosmetic Act (sec. 704) which authorizes us to inspect the factory, warehouse, establishment, or vehicle involved, "and all pertinent equipment, finished and unfinished materials, containers, and labeling therein." We understand that the thought behind the limited provision of the bill is that, in determining whether a package is subject to the labeling requirements of the bill, the character of the finished material governs, and that the hazardous or nonhazardous nature of particular components is likely to differ from that of the final mixture and is, therefore, immaterial.

This, however, is a gross oversimplification. In the first place, the bill requires the label of the finished hazardous mixture to state the name "of the hazardous substance or of each component which

contributes substantially to the hazard." We interpret this to require label disclosure of the name of each component which contributes to the hazard in such a way that a physician should know which are the significant ingredients involved, so that he may without delay administer proper treatment. We are, therefore, directly concerned, for enforcement purposes, with the components of finished materials. Again, inspection of ingredients and unfinished materials would help us in many ways to determine whether and what analysis of finished materials is needed, and to relieve us, by a screening process, from a great deal of enforcement activity in which we would otherwise have to engage. At the same time, through this screening and elimination process, reputable manufacturers would be relieved of far more burdensome enforcement procedures to which they might otherwise have to be subjected.

Trade secrets learned by inspectors would be protected by the provisions of 18 U.S.C. 1905, and any lingering apprehension industry might have about protection of its trade secrets could be allayed by a special provision like that contained in section 301(j) of the Federal Food, Drug, and Cosmetic Act.

Enclosed herewith is a memorandum submitting suggested statutory language for a broadened inspection provision as above recommended.

(*b*) *Injunctions.*—Provisions should be made for injunctions to restrain violations (cf. secs. 302, 307 of the Federal Food, Drug, and Cosmetic Act).

(*c*) Penalties: The penalty section of the law should be amended so that the heavier penalties for second-offense violations would apply also to first offenses committed with intent to defraud or mislead. Moreover, it should be noted that the bill does not authorize imprisonment at all for a first offense, while the Federal Caustic Poison Act authorizes imprisonment up to 90 days for a first offense. We suggest that this be permitted also under the bill, as a deterrent against violations.

2. Coverage of bill

(*a*) *Basic definition of "hazardous substance".*—In order to be a hazardous substance within the meaning of the bill, a substance (or mixture of substances) must meet two basic requirements. First, it must be "toxic," "corrosive," an "irritant," a "strong sensitizer" designated as such by the Secretary, or "flammable," or one which generates pressure through decomposition, heat, or other means. (The quoted terms are all defined.) Secondly, the substance is considered hazardous only if it "may cause substantial personal injury or illness during any customary or reasonably anticipated [sic] handling or use." We have several suggestions for improvement or clarification of this definition.

(1) We suggest clarification of this provision (p. 2, lines 18–21), not only by changing the word "anticipated" (which appears to be a typographical error) to "anticipatable" or, preferably, "foreseeable," but to make plain the intent that injury or illness resulting from any reasonably foreseeable use or handling which is accidental or otherwise unintentional, such as ingestion by children, is intended to be included.