

The Warren Air Force Serum Collection

**Housed at:
Department of Pediatrics
University of Minnesota Medical School
Minneapolis, MN**

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Professor of Pediatrics
University of Minnesota Medical School
Minneapolis, MN USA**

Purpose of this DHB Briefing:

Seek confirmation of AFEB and ASD action from 2004-05 to maintain this valuable Warren Air Force Base serum repository dating from 1949-1952.

Borden Institute

THE ARMED FORCES EPIDEMIOLOGICAL BOARD

The Histories of the Commissions



USAF Hospital; Warren Air Force Base, Wyoming



I. History of the Collection:

These sera were collected from **Air Force recruits** at the time of the Korean War. They were collected as a part of the extensive studies of streptococcal infections and rheumatic fever carried out by Dr. Charles Rammelkamp, Dr. Lewis Wannamaker, Dr. Floyd Denny, Dr. Harold Houser and others. The group was awarded a Lasker Prize for this work. Much of what is known about the epidemiology of group A streptococcal infections was learned during the Warren studies between 1949 and 1952 which were **supported by the AFEB..**

Shortly before retirement in the late 1970s, Dr. Rammelkamp gave the entire collection to Dr. Edward Kaplan (Department of Pediatrics; University of Minnesota Medical School; Minneapolis) to care for and to make certain that only deserving scientific studies would be chosen for future use of the sera.

The samples have been frozen for the past five decades at -20 degrees. Prior to moving the collection to Minnesota, the collection was housed in a walk in freezer. Since being moved to Minnesota the collection has been maintained in freezers at the same temperature. As far as is known, the entire collection has not been subjected to multiple freeze/thaw cycles. At the present time the entire collection is carefully catalogued and put into a computer data base that allows determination of where any given serum is located and how much serum remains from any given identifiable subject. One of the samples from each of the subjects has been thawed and aliquoted into 1.0 ml aliquots in order to eliminate any freeze/thaw problems.

As far as can be determined, there has not been any evidence of significant “deterioration of antibody within these constantly frozen samples.

II. Collection Size and partial descriptive information:

The serum vial labels display the following information: Serum number, date, last name, Warren study number identification.

When the information for these sera was entered in the database, an estimated serum volume was also recorded for each vial of serum.

Warren sera: 48,056 serum vials are available

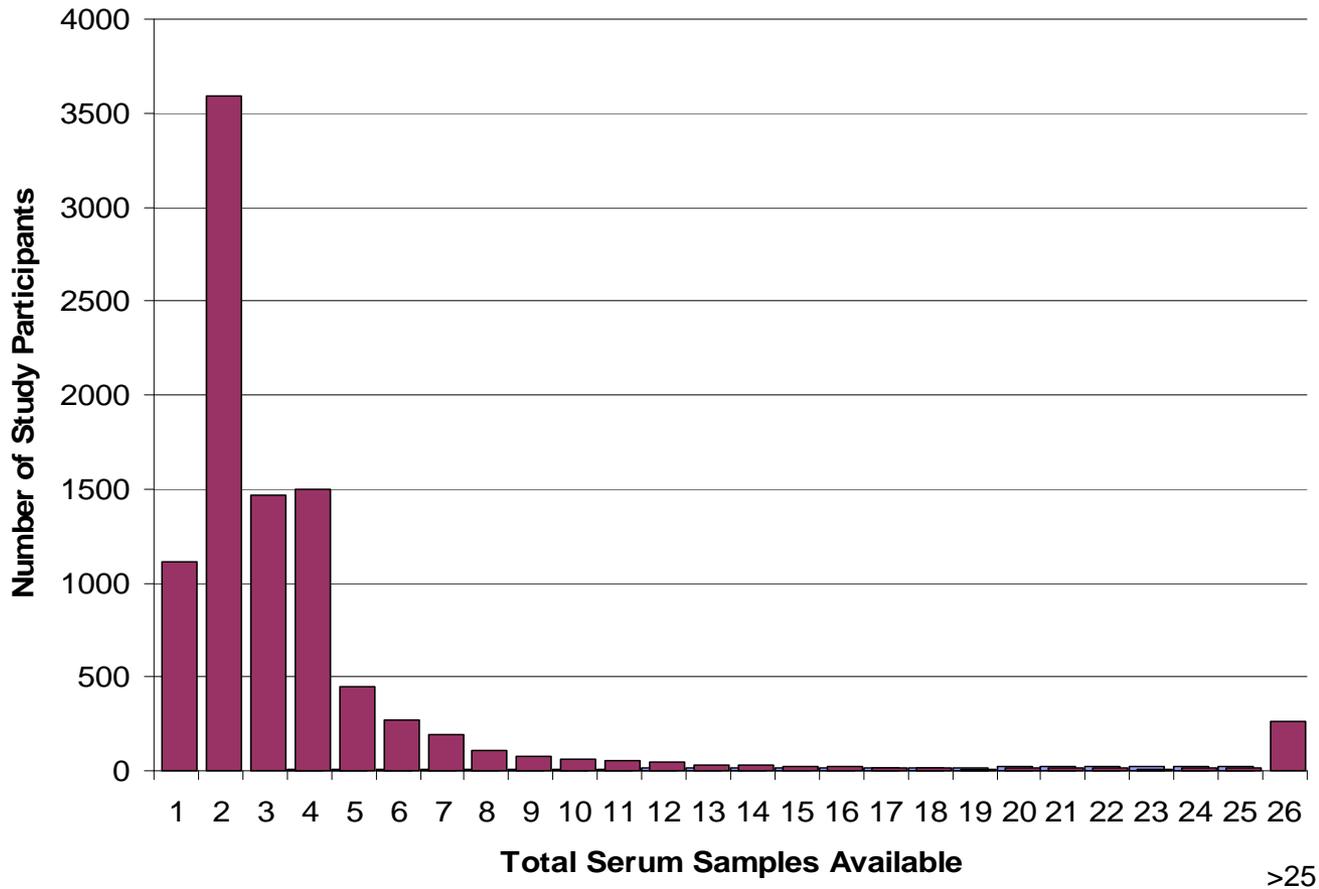
Mean volume for the 43,095 sera originally was 4.08 mL

Mean number of sera per individual was $43,095/9427 = 4.6$

1110/9422 (12%) had only one serum available.

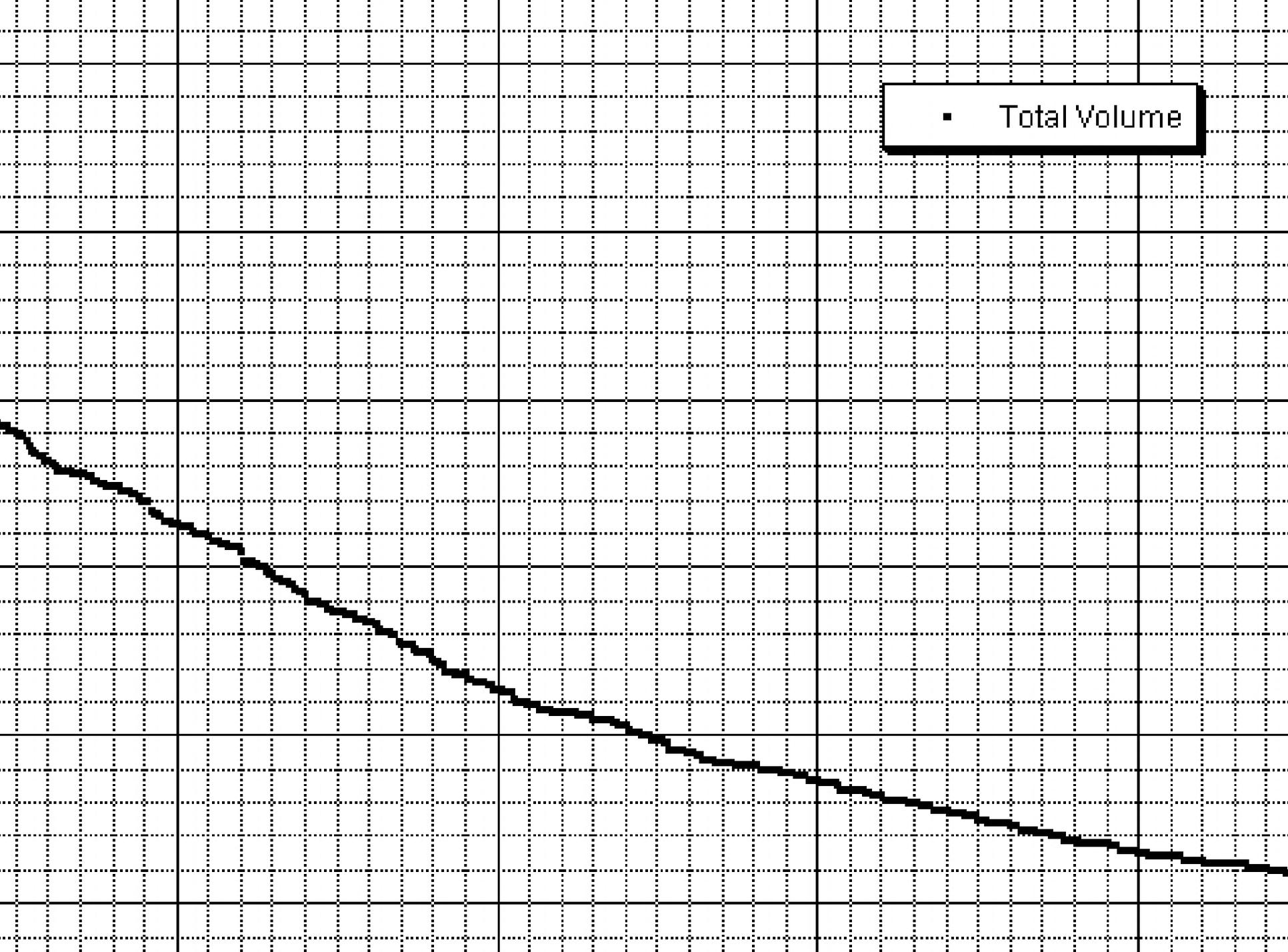
Approximately $\frac{1}{2}$ of patients had 6 or fewer serum samples available.

Number of Serum Samples Available per Participant



Serum samples available in collection

■ Total Volume



Brief “recent” history

- December 2004: Presentation of collection to the AFEB meeting.
- May 2005: Memorandum from Drs. Poland and Gibson to ASD Winkenwerder
- September 2005: Memorandum from ASD Winkenwerder to AFIP.
- November 2008: Drs. Kaplan and Gibson visit Wright-Patterson AFB (LTC Woodruff)
- April 2009: Telephone conference; Memo from MFUA (Erdtmann)
- May 2009: Briefing of DHB



Warren AFB Original Card Files



USA-MD-380-34 SL

Bryant, Arthur T. Jr. 12313736

P-516
P-1435
P-878

Bat - Bri

Ce - Cye

Bri - Ce

USA-MD-380

USA. MD-380-34 SL

Buel, Donald E.

16412129

P-17499
P-15815
Q-2106

Bri - Ce



Current storage (partial view) in “new” freezers











Freezer for aliquoted samples



Aliquoted samples stored in freezer



Storage of aliquoted samples

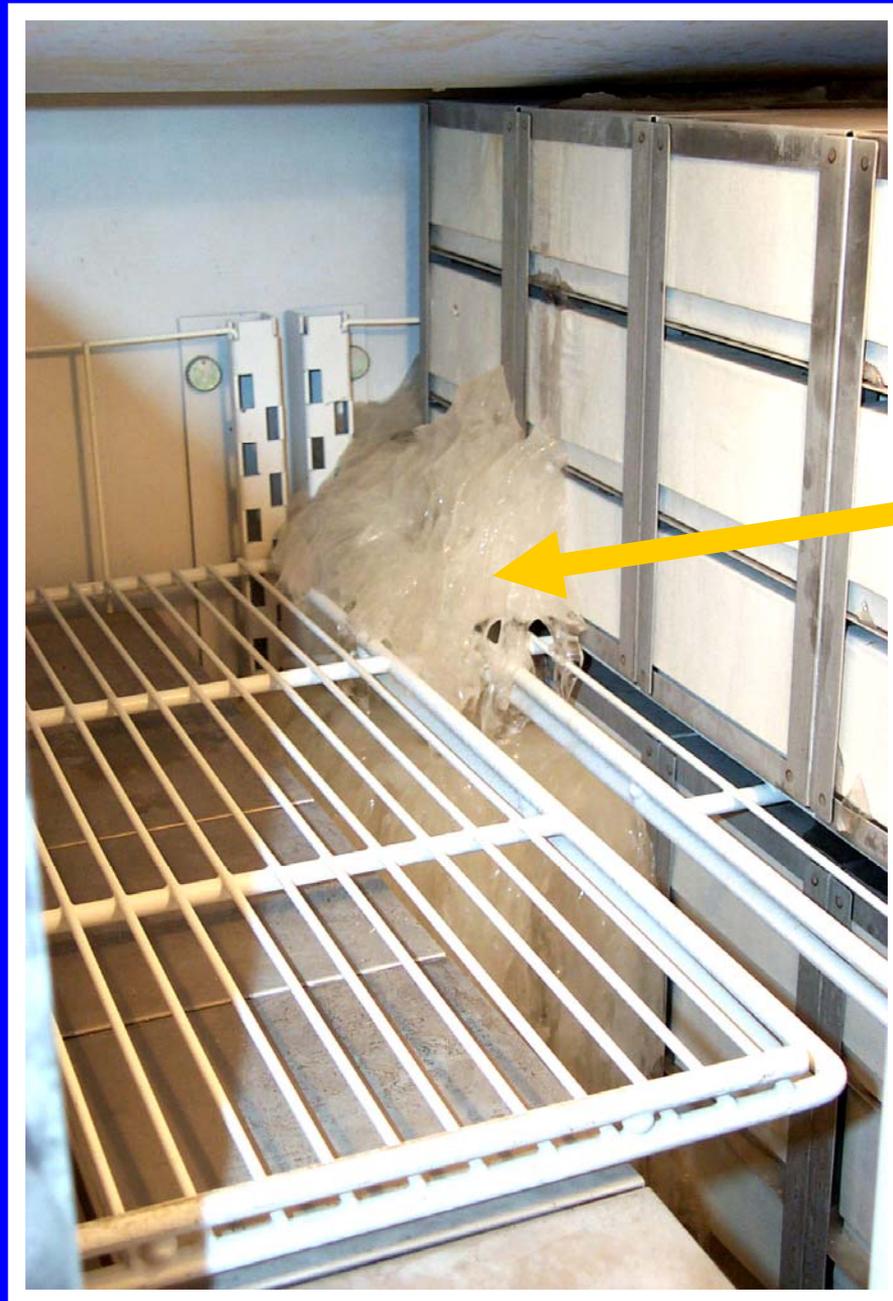


All samples (aliquoted or not) stored in data base with exact freezer box location





Stored aliquoted samples



**Recent ice build up.
Accidents do happen and
need to be anticipated.**



Examples of importance of this collection:

Lasker Award for these studies in 1954

Classic papers in the field of streptococcal infections and sequelae

Future studies: Examples

**Prevention of rheumatic fever:
treatment of the preceding
streptococcal infection**

**Denny, F. W., L. W. Wannamaker, W. R. Brink,
C. H. Rammelkamp, Jr., and E. A. Custer**

New England Journal of Medicine 143:151-3, 1950

**The relation of antibody production
to the development of rheumatic fever**

**Denny, F. W., L. W. Wannamaker,
and C. H. Rammelkamp, Jr.**

American Journal of Diseases of Children 80:506, 1950

**Effect of penicillin and Aureomycin
on the natural course
of streptococcal tonsillitis and pharyngitis**

**Brink, W. R., C. H. Rammelkamp,
F. W. Denny, and L. W. Wannamaker**

American Journal of Medicine 10:300-8, 1951

**Prophylaxis of acute rheumatic fever by treatment
of the preceding streptococcal infection
with various amounts of depot penicillin**

**Wannamaker, L. W., C. H. Rammelkamp, F. W. Denny,
W. R. Brink, H. B. Houser, E. O. Hahn, and J. H. Dingle**

American Journal of Medicine 10:673-95, 1951

**Comparative Effects of Penicillin, Aureomycin,
and Terramycin on Streptococcal
Tonsillitis and Pharyngitis**

Denny, F., L. Wannamaker, and E. Hahn

Pediatrics 11:7-14, 1953

**The effect of penicillin prophylaxis
on streptococcal disease
and the carrier state**

Wannamaker, L., F. Denny, and W. Perry, et al

New England Journal of Medicine 249:1-7, 1953

**Transmission of group A streptococci, I.
The role of contaminated bedding**

**Perry, W. D., A. C. Siegel, C. H. Rammelkamp, Jr.,
L. Wannamaker, and E. C. Marple**

American Journal of Hygiene 66:85-95, 1957

**Transmission of group A streptococci, II.
The role of contaminated bedding**

Perry, W. D., A. C. Siegel, and C. H. Rammelkamp, Jr.

American Journal of Hygiene 66:96-101, 1957

Example of “recent” studies utilizing Warren sera and MFU collaboration

45-Year Follow-up of Hepatitis C Virus Infection in Healthy Young Adults

Seeff, L. B., R. N. Miller, C. S. Rabkin, Z. Buskell-Bales, K. D. Straley-Eason, B. L. Smoak, L. D. Johnson, S. R. Lee, and E. L. Kaplan

Annals of Internal Medicine 132:105-111, 2000

A collaborative effort

Rubio-Tapia A, Kyle RA, **Kaplan EL**, Johnson DR,
Page W, **Erdtmann F**, Brantner TL, Kim WR, Phelps TK,
Lahr BD, Zinsmeister AR, Melton III LJ, Murray JA.
Increased Prevalence and Mortality of Undiagnosed Celiac Disease.
Gastroenterology (in press, 2009).

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Thank you for your attention.

Questions?