VIỆT NAM
and
the Legacy of Agent Orange

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Chemical agents sprayed over the South of Việt Nam during wartime (8/1961-1971)

Agent	Composition	Quantity sprayed (million gallons)
Orange	2,4-D 2,4,5-T	11,22
White	2,4-D Picloram	5,24
Blue	Cacodylic acid	1,12
Total		**17,58**

Westing A.Z. et al. as well as other scientists in many countries have analyzed dioxin in soil, human blood or adipose tissue in Viet Nam and concluded that:

* average dioxin level in sprayed areas in Viet Nam was 150 times higher than standard of former Soviet Union and 50 times higher than those of European Union.
* estimated dioxin intake of people living in Agent Orange sprayed areas during American War was 4 mg / kg of body weight/24 hours compared to acceptable standard in US (0.1 pg / kg / 24 hours).

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Persistence of Dioxin in the environment in Viet Nam (2005)

"Hot spot"	Dioxin level	Surface depth
DA NANG	34,000 ppt	0 – 30 cm
(US Air Force base)	950 ppt	120 – 150 cm
PHU CAT	11,400 ppt	0 – 30 cm
(US Air Force base)	500 ppt	90 – 120 cm
BIEN HOA	27,500 ppt	0 – 30 cm
(US Air Force base)	500 ppt	90 – 120 cm

Agent Orange and the Vietnamese: Stellman estimated about 4.8 million Vietnamese people exposed to Agent Orange/Dioxin during after the war

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Agent Orange and the Vietnamese: The persistence of elevated levels in human tissues

Arnold Schechter, MD, MPH, Le Cao Dai, MD, Le Thi Bich Thuy, MPH, Hoang Trong Quynh, MD, Dinh Quang Minh, MD, Hoang Dinh Cau, MD, Pham Hoang Phiet, MD, Nguyen Thi Ngoc Phong, MD, John D Constable, MD, Robert Baughman, MD, Olaf Papke, MS, J J Ryan, PhD, Peter Fürst, PhD, and Seppo Räisänen, PhD

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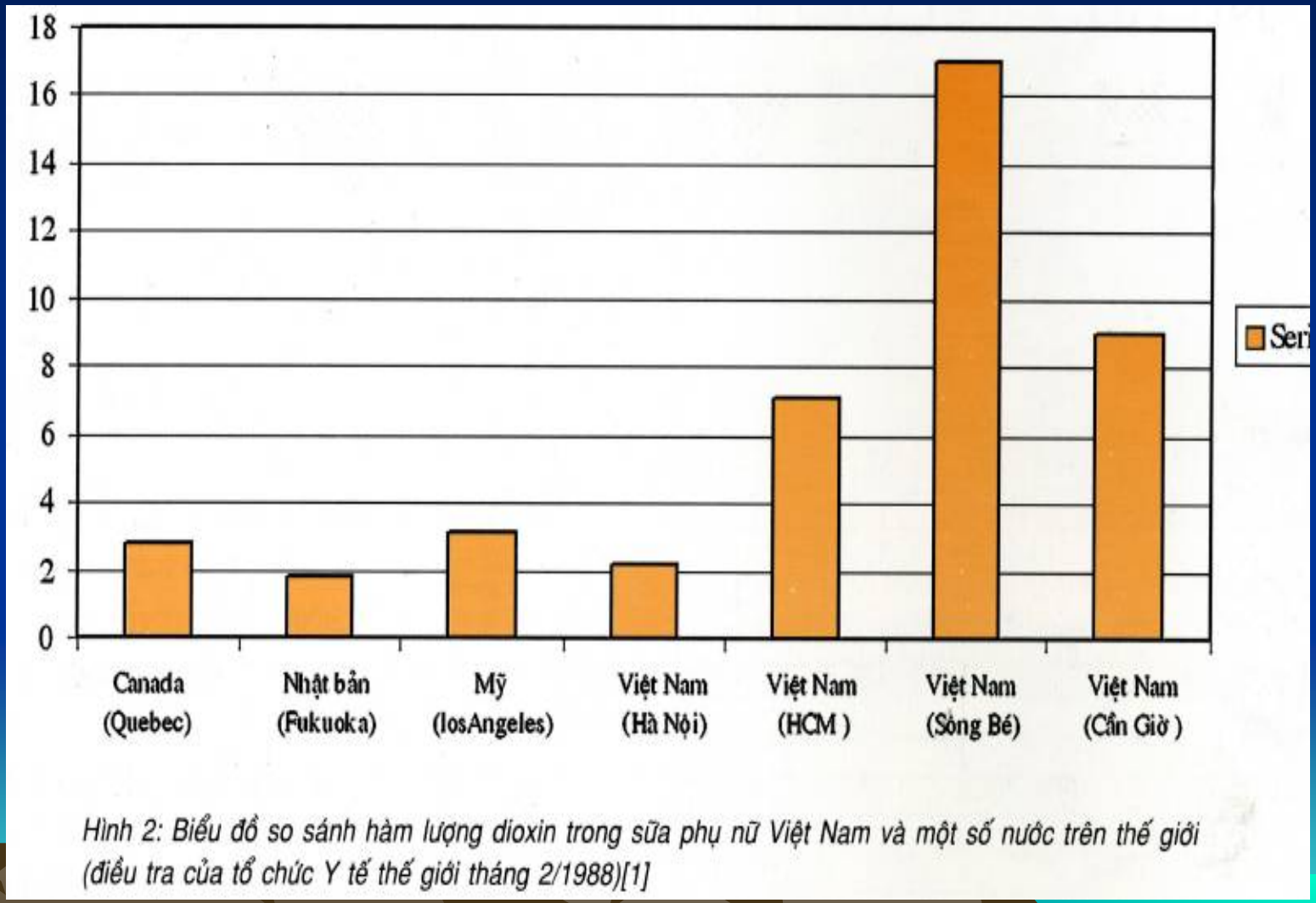
	Sprayed Areas (n = 896)			Unsprayed Areas (n = 144)		
	Blood (n = 716)[a]	Milk (n = 90)[b]	Adipose (n = 90)[c]	Blood (n = 82)[d]	Milk (n = 36)[e]	Adipose (n = 26)[f]
Weighted mean	12.6	7.5	14.7	2.2	1.9	0.6
Minimum	3.4	ND (1)	ND (2)	ND (1)	ND (1)	ND (1)
Maximum	32	17	103	2.9	2.1	1.4

Note. ND = not detected, with detection limits in parentheses.
[a]13 pools, n = 50; 2 pools, n = 33.
[b]6 pools, n = 2; 4 pools, n = 3; 6 pools, n = 4; 1 pool, n = 7; 1 pool, n = 8; 1 pool, n = 12; 1 pool, n = 15.
[c]90 individual analyses.
[d]1 pool, n = 32; 1 pool, n = 50.
[e]1 pool, n = 2; 2 pools, n = 3; 1 pool, n = 28.
[f]16 individual analyses; 1 pool, n = 10.

- Range and Weight Mean (Lipid Basis, Parts per Trillion) of 2,3,7,8_TCCD in Human Blood, Milk, and Adipose Tissue Samples from Area Sprayed with Agent Orange (Southern and Central Vietnam and Unsprayed Areas (Northern Vietnam), 1984 to1992.

- Dioxin levels in human breast milk of Vietnamese women who have lived in sprayed areas were as high as 1,832 parts per trillion (1970), 1,000 times higher than those in Canada, US and Japan.

Dioxin content in breast milk of women living in a number of countries (1988)



Hình 2: Biểu đồ so sánh hàm lượng dioxin trong sữa phụ nữ Việt Nam và một số nước trên thế giới (điều tra của tổ chức Y tế thế giới tháng 2/1988)[1]

Persistence of Dioxin in the human body of exposed Vietnamese people

In 2006, analysis of samples of adipose tissue from 6 persons sent to Olaf Papke's laboratory (Eurofins Ergo) showed the following results:

- **2** exposed during the wartime, then living in HCM City since 1975: **7–7.8 ppt**
- **1 women** moved to sprayed area in Sa Thay–Gia Lai in 1976 and to HCMC in 1988: **3.7 ppt**
- **3 men** living in sprayed area in Sa Thay–Gia Lai since 1976: **2–3 ppt**

The evidence shows

- Dioxin still persists in the environment (hot spots).
- Dioxin is still present in the human body of exposed people in Việt Nam.

Environmental remediation in Vietnam is an on-going effort of the Vietnamese government and people.

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More than half of sprayed mangrove forest areas recovered through reforestation

although the report of the US National Academy of Sciences in 1974 said:
"*. . . it may take well over 100 years for the mangrove area to be reforested* . . ."

(page S-9, US NAS report 1974).

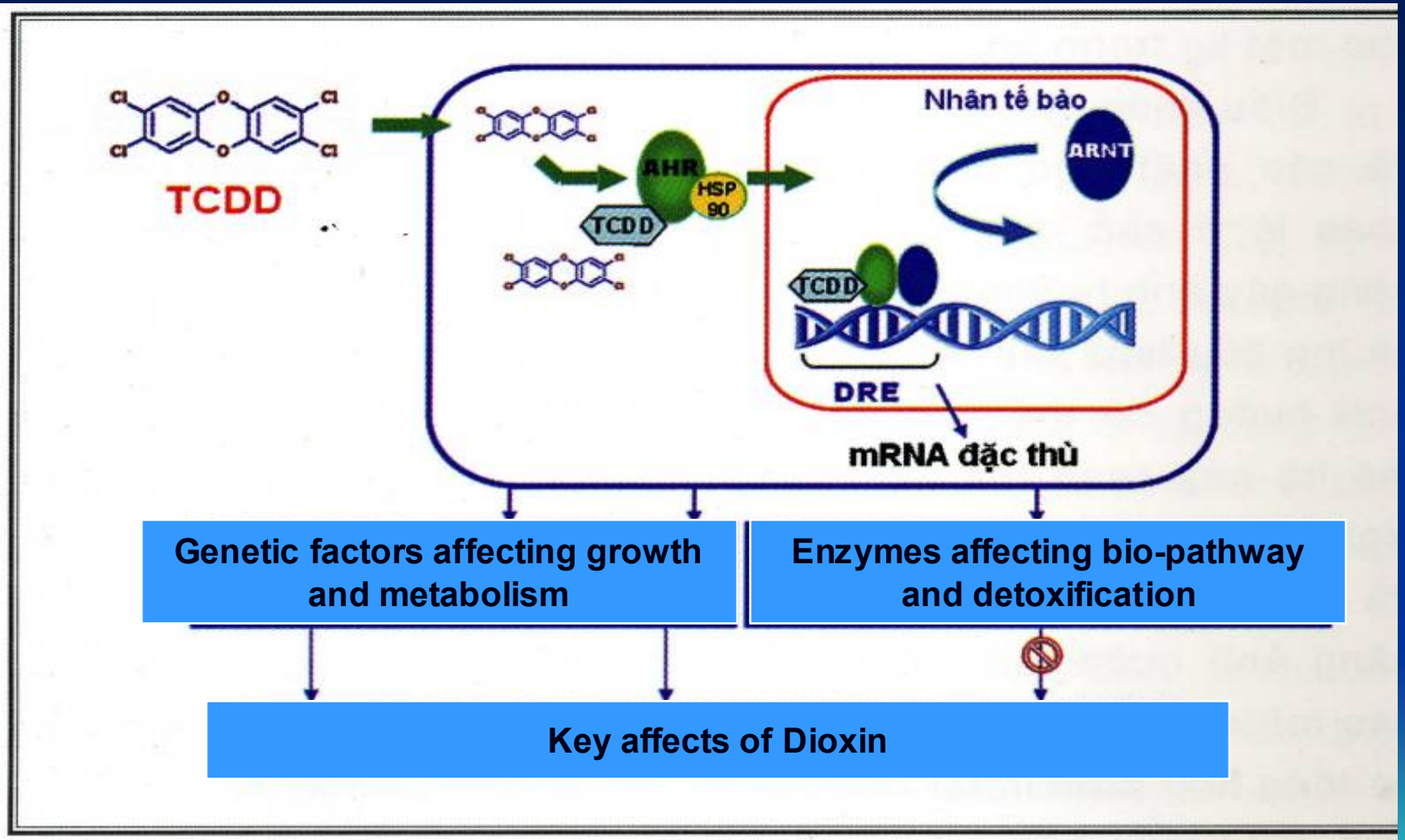
Many “hot spots” remain to be remediated, with large anticipated costs

In addition to the effects on the economy and agriculture . . .

"*. . . clearing of mangrove forests may lead to environmental changes that favor vectors of human diseases such as malaria, dengue fever . . .*"

(according to the US NAS report – 1974, page S-12)

Molecular mechanism of TCDD effects



Hình 3: Quá trình tương tác của dioxin với phân tử ADN trong tế bào

Many studies around the world have proved that dioxin can cause a wide range of cancers:

- soft tissue carcinomas
- upper respiratory tract carcinoma
- leukemia
- non-Hodgkin sarcoma and Hodgkin disease
- prostate cancer
- multiple myeloma . . .

A study from Viet Nam (1983) revealed:

"*Veterans who served for more than 10 years in the south of Vietnam during the war have a significantly increased risk for liver cancer*" **with OR = 8.8, 95% CI = 1.9 to 41**

(after adjustment for matching variables, hepatitis B antibody status and alcohol consumption).

* OR = odd ratio. ** CI = confident interval.

International Agency for Research on Cancers (1997) confirmed:

"*2,3,7,8 TCDD is a carcinogenic agent*"

and

the US government has inadequately compensated the American Vietnam veterans and their offspring for 13 cancers, diseases and defects caused by Agent Orange/Dioxin.

In Việt Nam,
exposed people who have cancers have been dying day by day.

Most of them are very poor.
Vietnam lacks sufficient facilities to treat them because it is still a very poor country.

Dioxin exposure and birth defects: A case control study at the Tu Du Hospital (2005)

Investigators:

Vo Minh Tuan M.D, M.Sc, M.P.H.
Nguyen Thi Ngoc Phuong, M.D.
Huynh Thi Thu Thuy, M.D.

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Scales of dioxin exposure

Exposed areas were based on dioxin-spraying map of the US Army during the American war in Vietnam:

Scale I Subjects were exposed directly and lived in the sprayed areas before 1975 more than 15 years.

Scale II Subjects were exposed directly and lived in the sprayed areas before 1975 up to 15 years.

Scale III Subjects were exposed indirectly and lived in the sprayed areas after 1975 more than 15 years.

Scale IV Subjects were exposed indirectly and lived in the sprayed areas after 1975 less than 15 years.

Scale V Non-exposed subjects.

Distribution of dioxin exposure within 2 recruited groups

Scale of dioxin exposure	Cases	Controls	Total
Scale I	16	2	**18**
Scale II	3	1	**4**
Scale III	61	96	**157**
Scale IV	98	166	**264**
Scale V	194	465	**659**
Total	**372**	**730**	**1,012**

Case = women who give birth to deformed babies.
Control = women who give birth to normal babies.

Summary of the relation between dioxin exposure scale and birth defects

Exposure scale	Cases	Controls	OR	P-value
Scales I & II	19	3	14.85 (4.11-63.79)	0.001
Scale III	61	96	1.52 (1.04-2.22)	0.02
Scale IV	98	166	1.42 (1.04-1.93)	0.02
Scale V (standard)	194	465	1	*

Types of birth defects

		# of Cases	Rate
1	Anencephaly	51	13.8%
2	Hydrocephaly	53	14.3%
3	Encephalocele	3	0.8%
4	Cleft lip/palate	15	4.1%
5	Cystic hygroma	9	2.4%
6	Myelomeningocele	3	0.8%
7	Spina bifida	2	0.5%
8	Genu valgum / varum	7	1.9%
9	Dactylar disease	3	0.8%
10	Short limbs	4	1.1%
11	Lack of limbs	1	0.3%
12	Hydrops	55	14.9%
13	Umbilical and abdominal hernia	19	5.1%

		# of Cases	Rate
14	Oesophagus atresia	3	0.8%
15	Unomphalus	4	1.1%
16	Lack of anus	5	1.4%
17	Diaphragmatic hernia	6	1.6%
18	Urinary tract defects	7	2.4%
19	Sexual organ malformation	22	5.9%
20	Congenital heart disease	4	1.1%
21	Down syndrome	16	4.3%
22	Inguinal hernia	0	0%
23	Angioma	1	0.3%
24	Multiple birth defects	90	24.9%
25	Miscellanneous	15	4.1%

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Microcephaly

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Lack of limbs

Spina bifida

Phocomelia

Disabled children in Tu Du Hospital

Disabled children in Tu Du Hospital

The above study shows

* significant relationship between Dioxin exposure and birth defects.
* existing correlation between amount of dioxin exposure and rate of birth defects.

In addition to spina bifida, as in the case of Admiral Zummwalt's grandson, there are many other defects among the children of those exposed to the spraying of chemical agents.

Children and grandchildren of US veterans and Vietnamese from both sides in the war are now suffering with multiple types of birth defects

Specific processes have been developed since the 1980's to:

* detect cancers at early stage;
* detect birth defects during the prenatal care.

These have been applied in all hospitals in Vietnam since 1990's.

The needs are great to equip hospitals with the facilities for diagnosis of birth defects and cancers at an early stage.

In Việt Nam, as in other developing countries, financial and human resources are limited.

CHỦ TỊCH NGUYỄN MINH TRIẾT
VÀ TỔNG THỐNG GEORGE BUSH
NÓI VỀ KHẮC PHỤC HẬU QUẢ
CHẤT DIỆT CỎ DIOXIN

Ảnh: TTXVN

Thượng viện Mỹ thông qua ngân sách đối ngoại năm 2007 của Mỹ, trong đó có một khoản là 3,2 triệu USD để giúp Việt Nam tẩy độc dioxin tại các vùng ô nhiễm nặng và giúp đỡ cộng đồng dân cư sống gần vùng ô nhiễm. Sau đó Hạ viện Mỹ cũng đã đồng ý nhưng giảm xuống chỉ còn 3,0 triệu và ngày 26 tháng 5 năm 2007, Tổng thống Mỹ đã phê duyệt khoản tiền này.

Trong cuộc gặp Chủ tịch Nguyễn Minh Triết, Tổng thống Mỹ đã chính thức thông báo quyết định này và có nhận xét là còn "ít". Tổng thống Mỹ đã nhận xét rất đúng vì để tẩy độc triệt để các vùng ô nhiễm nặng và phục hồi môi trường tại các khu vực này, theo tính toán của một số chuyên gia nước ngoài, cần ít nhất là 43 triệu USD. Số tiền để giúp đỡ những nạn nhân của chất diệt cỏ/dioxin còn lớn hơn nhiều./.

Văn phòng Ban Chỉ đạo 33

Hình ảnh 1 đoạn báo cáo của Thượng viện Mỹ, phần về Việt Nam

Số 05 năm 2007 Độc lập 59

Meeting of the two presidents on the remediation of the Agent Orange consequences in Viet Nam

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Beginning from June of this year, a Viet Nam – US dialogue group has been created to discuss the assistance from the US to Viet Nam to clean up "the hot spots" and to provide medical assistance to the victims.

President Bush and the US Congress have allocated about $2-3 million for environmental remediation in Da Nang Air Force Base.

But much more is needed:

- for the environment, and
- for people's health and survival?

Victims of Agent Orange /Dioxin in Vietnam, in the US and in other countries need high quality care which can detect and treat illnesses, diseases and defects caused by Agent Orange / Dioxin.