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December 14, 2004

Via Email, Fax and FedEx

Mr. Joe Thompson
U. S. Bureau of Reclamation
South Central Division
1243 N Street
Fresno, CA 93721

Re: Comments on Draft Environmental Assessment on Long-Term Contract Renewals in the Delta-Mendota Canal Unit

Dear Mr. Thompson:

The organizations whose names appear on this letterhead submit the following comments regarding the Delta-Mendota Canal Unit Draft Environmental Assessment and Finding of No Significant Impact (DEA/FONSI) for just twenty of twenty four contractors comprising the Delta-Mendota Canal Unit (DMC). It is stated that environmental compliance for the four additional DMC district contract renewals will be evaluated in the San Luis District (SLU) Environmental Impact Statement (EIS).

DEA/FONSI/DMC Should Be Withdrawn

The DEA/FONSI should be withdrawn. The document on its own is not in compliance with the law, the National Environmental Policy Act (NEPA). In addition, some DMC water contract districts are located, at least partially, within the San Luis Unit (SLU) of the Central Valley Project (CVP). Further, some of the DMC districts also are proposed to be purchased, or water transfer/assignments made to San Luis Unit contractors or others. DMC and SLU contractors also jointly contribute to major irrigation runoff drainage problems that adversely impact the environment.

NEPA compliance for contract renewals should include both CVP Units – DMC and SLU - and should be evaluated in a single EIS. At a minimum, the DEA/FONSI standing

alone is legally insufficient and not in compliance with NEPA for reasons set forth below. In addition, since the contracts are not in compliance with many provisions of the Central Valley Project Improvement Act Public Law 102-575 (CVPIA), it is doubtful the contracts would be legal, even assuming adequate compliance with NEPA.

Statement of Purpose and Need Fails Legal Requirements

The Statement of Purpose and Need in the DEA is unreasonably restricted and narrowed. This is prohibited by NEPA. The Statement indicates that its purpose is "to renew the DMC long-term water service contracts..." Such a limited purpose clearly sets forth a determination of the outcome of a NEPA environmental review and evaluation before that legal obligation even is initiated. The result of this action circumvents and tosses aside the requirement that all relevant alternatives be considered.

A new Statement of Purpose and Need, as part of an EIS covering both the DMC and SLU long-term contract renewals, is required. It must set forth that the renewal of DMC and SLU contracts is but one alternative, among many alternatives available to the Bureau of Reclamation (BOR). Only four limited alternatives were evaluated in the DEA/DMC and two of those – Preferred Alternative and No Action Alternative essentially are the same, since the latter relied upon the Preferred Alternative of the CVPIA Programmatic EIS. It assumed contract renewals. In fact, no alternative exists for an actual "No Action Alternative." Presumably, no action would mean no action - the non-renewal of contracts.

Insufficient Number of Alternatives Evaluated

BOR, in a new DMC/SLU EIS, also must evaluate other alternatives, including that contracts need not be renewed, contract water delivery volumes are reduced, and contract renewals can be contingent upon adoption and implementation of a solution to disposing safely of poisoned irrigation runoff/drainage from both DMC and SLU contractors. For reasons set forth in more detail below, an EIS that includes both DMC and SLU contractors also should be delayed until completion of the *San Luis Drainage Feature Re-evaluation Plan Formulation Report* (SLDFRE) EIS.

The first two of these options are particularly relevant since the BOR already has contracted to deliver more water than is available to it in the CVP. Beyond that reality, insufficient water is available to the BOR to protect listed species of fish and wildlife, as well as fish, wildlife and other legislated environmental needs and purposes, and the federally reserved fishing rights of two Native American Tribes – the Hoopa Valley and the Yurok Tribes. Sufficient water also is unavailable to comply with terms and conditions of the BOR's State Water Permits, and with provisions of the CVPIA and the Endangered Species Act (ESA). Enhancement of California's fish and wildlife populations was one of the three principal objectives of the CVPIA.

Impacts Undisclosed/Not Evaluated/Not Evaluated Adequately

Studies dating back more than a decade and a half, including the September 1990 *Management Plan for Agricultural Drainage and Related Problems on the Westside San Joaquin Valley*, the so-called "Rainbow Report," seeking a solution to drainage problems

have cost state and federal taxpayers more than $140 million and are continuing to grow with preparation of the SLDFRE. To this day, however, no long-term permanent corrective action yet has been initiated.

In addition, even with completion of San Luis Drain, which is being considered in the SLDRE and would dump this poisoned runoff into San Francisco Bay, which is totally unacceptable, one can conclude from the Rainbow Report that continued irrigation of the lands in some districts covered by these proposed contracts and others likely will result in expansion over the next 40 years from a 450,000 acre highly contaminated aquifer to a 950 thousand acre toxic drainage problem area in the Western San Joaquin Valley.

According to the December 2000 *United States Geological Survey Open File Report 00-416*, even if irrigation of drainage problem areas were halted today, it would take 63 to 300 years to drain contaminated water from the Western San Joaquin Valley's aquifer underlying these irrigator's/contractor's lands. A 950 thousand acre highly toxic region – more toxic than currently exists - in the Western San Joaquin Valley within the next 40 years will result. This condition strongly supports a non-renewal of contracts and retirement of affected lands, that is, most of the irrigated Western San Joaquin Valley.

Contaminated drainage from some of these districts and others, including the SLU, also seriously impacts adversely the quality of water in the Lower San Joaquin River – a waterway that never meets established water quality standards – adversely impacts the quality of water used by Delta area farmers, and seriously impacts adversely water quality used by two-thirds of California's population that relies upon water that passes through the San Francisco Bay Delta.

Even without a San Luis Drain to the Bay-Delta, the DEA/DMC must analyze the downstream effects of poisoned agricultural drainage that extends into the Grasslands wetlands, Mud Slough, the San Joaquin River, the Delta and the San Francisco Bay estuary, including effects upon fish and human health.

The contracts' result of poisoned irrigation runoff from some districts in the DMC is not even considered in the DEA/FONSI in opting for renewal of contracts under the Preferred Alternative. To assume that continued irrigation of these lands at present volumes will have no effect upon widely recognized, acknowledged and accumulating poisoned irrigation drainage is absurd, and failure to disclose and analyze the consequent effects violates NEPA. Irrigators whose lands are affected by these conditions are acutely aware of these problems. In a transparent attempt to finesse this issue and its

required analysis, the document briefly discusses Soils and Geology and indicates contract renewals will not adversely affect drainage problems.

An analysis and discussion of the relationship between the SLDFRE and DMC long-term contracts, including existing or likely water transfers or assignments must be considered and evaluated in order to comply with NEPA.

In addition, CVPIA b2 water (800,000 acre-feet annually) mandated by that law for all environmental needs never has been delivered fully, has been reduced twice and is in process of being reduced again – creative arithmetic notwithstanding. This impact to that environmental water from renewal of contracts is not considered in the DEA/FONSI.

While the DEA/FONSI casually refers to federal trust responsibilities to protect tribal fishery resources and refers to the Trinity River Flow Evaluation Study, the document fails to address BOR's legal obligations to the Hoopa Valley and Yurok Tribes as mandated in CVPIA. Contracts should specify clearly that the Interior Secretary's fiduciary obligation to these Tribes, and mandated in the CVPIA take precedence over water deliveries to contractors. Nowhere in the DEA/DMC does the BOR acknowledge that federal laws – CVPIA and ESA - and reserved tribal fishing rights dating back 10,000 years or "time immemorial" are superior to water deliveries to irrigators. This impact should be recognized and specific language should be included in contracts to put contractors on notice of this legally mandated priority water allocation obligation of the BOR.

The DEA/DMC fails to include an analysis of the relationship between the BOR's Operating Criteria and Plan Biological Opinion (CVP-OCAP BiOp) and these long-term contract renewals. There is reference to a consultation process for biological assessments resulting from OCAP impacts, but the document does not include a Biological Opinion. There is no reference to or analysis of the CVP-OCAP BiOp which could be significant. In addition, Biological Opinions by the United States Fish & Wildlife Service (USF&WS) and the National Oceanic and Atmospheric Administration (NOAA) for DMC and related projects beyond OCAP and including the Grasslands Bypass Project, the December 2000 Trinity River Record of Decision, Sacramento River and San Francisco Bay Delta are not included.

The DEA must disclose, review, and evaluate operative BiOps and regulatory findings relevant to the DMC Unit, the status of BOR's compliance with their requirements, and the manner and extent to which these BiOps affect the environmental context and impacts of the proposed action.

Obligations of contractors to repay capital costs to the CVP are not included in the DEA/DMC or contracts. An extremely minor portion of these obligations – several decades later – still has not been repaid (*1992 GAO Report for Representative George Miller*). Only about ten percent of capital costs have been repaid 12 years after this

report. Operation and Maintenance costs are to be reassessed annually. The law requires that **all** costs be paid in full by 2030 (P.L. 99-546). The document should include an analysis of the ability and intended procedure for assuring repayment of contractors'/beneficiaries' legally binding and unpaid financial obligations to the federal government – to taxpayers. It appears that contracts of some districts, for unknown reasons, are being exempted from this legal requirement. The public is not informed of any factual basis for the determination and justification for a district not being required to meet its mandated repayment obligations, presumably under some "inability to pay" determination. This is unacceptable.

No genuine or realistic Water Needs Analysis is included and disclosed in the DEA/DMC. A Water Needs Assessment should be included in this document and fully analyzed and justified. The DEA indicates an analysis was undertaken, and there is a heading for it, but there is no real documentation of it included within the DEA/FONSI/DMC. The document refers to the subject in Chapter 2 and includes three tables, 2.2 – 2.4 which show the contract amounts, historic use in 1989, and expected use for 2025. This obviously is an inadequate analysis that does not deal with the issue.

The CVPIA requires that Water Conservation Plans must be filed and approved for all CVP contractors. Several water districts within the DMC Unit have not complied with this requirement. Until such time as this requirement is fulfilled, the DEA/DMC is premature. In addition, the DEA/DMC is grossly inadequate in dealing with the CVPIA mandate that it implement meaningful, effective criteria for the adequacy of districts' water conservation "plans," including "highest level of water use efficiency reasonably achievable by project contractors" using "best available cost-effective technology."

There appear to be no provisions in contracts for complete and binding assurance for compliance with this requirement and for BOR follow-through to assure that districts actually undertake any water conservation. What we have, then, is a paper plan with no meaning with the BOR ignoring these CVPIA requirements.

The DEA/DMC fails to discuss and analyze the consequences of failing to meet reasonable, achievable water use efficiency levels, on water diversion from higher uses, as well as on creation of more poisoned irrigation drainage.

Irrigation in much of CVP service areas still is by flooding or spraying. Many knowledgeable persons believe that if BOR pursued an effective conservation policy, potential water savings easily could amount to 10 percent to as much as 25-50 percent of applied water.

The DEA/DMC fails to analyze adequately the option of land retirement and resulting impacts upon water needs, reasonable and beneficial use (as required by the California Constitution and Water Code), poisoned irrigation drainage (as set forth above), water transfers/assignments, and consequential environmental impacts.

Also, given that some districts within DMC, such as Broadview to mention but one, with land not now suitable for farming, is assigning its water to Westlands Water District, a land retirement alternative clearly should be fully reviewed and analyzed. Within the DMC Unit, the Widren, Centinella and Mercy Springs Districts also plan to assign or transfer water under their contracts to Westlands. Renewal of long-term contracts with districts that no longer can use water under existing contracts is not comprehensible. If such contracts are to be renewed, major justification is required. The failure of the DEA to disclose and discuss all the environmental consequences of land retirement in DMC districts must be remedied to comply with NEPA.

The issue of land retirement not being addressed adequately in the DEA/DMC becomes even more significant when the acquirer of Broadview's water, Westlands, is suggesting retirement of up to a third of its 605,000 acres. Historically, Westlands generally has received water deliveries from the CVP of about 55 percent of its contract amount and occasionally 70 percent. Indeed, water renewal contracts currently being negotiated with Westlands apparently provide for increased actual water deliveries despite the fact that much of its land no longer is suitable for farming and additional land will become similarly useless if irrigation continues.

In addition, Westlands intends to acquire even more water from other districts as set forth above. Without going into exquisite detail, the unsuitability of irrigating these lands is the result of high concentrations of selenium, boron and other contaminants (poisons in concentrations existing in the Western San Joaquin Valley) and/or waterlogged land resulting from the shallow Corcoran Clay Barrier underlying much of this land.

The impact of groundwater recharge programs - direct, indirect, or otherwise - groundwater banking programs, surface water storage programs, and similar programs using CVP water or other water furnished irrigators is not even discussed or analyzed in the document.

Waterfowl continue to be deformed because of contaminated drainage water within the DMC and adjoining units. Selenium in eggs collected from the Grasslands Bypass Project reuse site in 2003 were highly elevated. Such concentrations of selenium have been found to be associated with deformities in birds, such as black necked stilts. Deformities would result in about 25 percent of these birds, according to analysis of this collected data. Deformed black necked stilts also have been observed currently by several persons. This is the result of irrigation of these toxic soils. Waterfowl poisoning and the consequent deforming of them is not addressed in the DEA/DMC. The DEA must disclose and analyze the environmental consequences of agricultural practices, such as pesticide application, that follow from the long-term water contracts. This omission must be corrected to comply with NEPA.

Pesticides sprayed or used on crops irrigated with CVP water within the DMC Unit, and other Units adversely affect the health of humans and wildlife. As merely one example, in Fresno County and the Central Valley area, the incidence of Parkinson's Disease in humans is at least twice as prevalent as in the San Francisco Bay Area, according to an analysis conducted for the Department of Veterans Affairs (VA). It is attached. This is attributed to toxic air, water or by direct contamination to individuals resulting from pesticide spraying or use on irrigated lands in the Western San Joaquin Valley. Pesticide impacts have not been analyzed. Impacts upon air quality from pesticide use by irrigators in the Central Valley have not been analyzed.

According to a recent study and analysis not yet published supported by NIA grant AG17824, the Sierra-Pacific Mental Illness Research, Education, and Clinical Center (MIRECC), and the Medical Research Service of the VA, amphibians in the Eastern Sierra are being killed to near extinction as a result of pesticide poisons that are carried by winds or otherwise to that area from Western San Joaquin Valley irrigated lands. This as yet unpublished report also is attached. This impact has not been analyzed. This omission must be corrected to comply with NEPA.

Contracts

While proposed contract language is not a part of the DEA/FONSI/DMC, contracts are the end product of this process and require comment – particularly in view of laws that have been enacted that affect their provisions. Sample contracts are available on BOR's website.

Contracts are proposed for a 25 year period with an automatic right to renew. This is counter to the clear intent of the law – the CVPIA. Contractor's have no such right. The law states that contracts may be renewed by the Secretary. This provision was included in the law to accommodate changing demographic, financial, environmental, and other factors as time passes, and to enable the reallocation of scarce developed water resources as conditions warrant, in this case 25 years from now. It is a clear violation of the intent of the law to provide, for all practical purposes, 50 year contracts.

Tiered-pricing provisions of contracts appear to be totally ineffective given historic volumes of water deliveries under current contracts. This language, in effect, simply ignores or makes irrelevant these requirements of the CVPIA. This is unacceptable and, in effect, completely disregards the law under which contracts are to be renewed. The new EIS for this project should discuss and disclose genuine alternatives for tiered pricing in accordance with the law.

The contracts also appear to continue BOR pricing of water at unrealistically low prices – if not even below cost – while many areas in the state are willing to pay market rates as high as $650 or more an acre foot for water. Given BOR's seeming indifference to water transfers/assignments, the effect of this pricing will be to enrich a handful of landowners.

Some districts involved do not even possess land that now is farmable. These landowners may choose to sell and profit substantially from their highly subsidized public water resource at the expense of taxpayers and at a time when the state universally faces major water shortages which will continue to increase. In general, it appears that the law simply is being ignored in constructing these proposed contracts. The contracts, rather, should parallel the law and should comply with it.

Summary

It is clear beyond question that the DEA/FONSI/DMC is grossly inadequate in meeting the requirements of the law. It also is clear that because of the inter-relationship between DMC and SLU on many major issues that need to be addressed in any environmental document – several of which were not even addressed in the DEA/DMC - that this document should be withdrawn. An EIS for contract renewals including both DMC and SLU should be prepared in a single document, and impacts that by law have not been included or analyzed in this document should be a part of any such document. Such an EIS also should await completion and absolute committed implementation of a satisfactory plan for disposal of contaminated irrigation runoff/drainage. A rewrite of contract terms also is required so that proposed contracts comply with applicable laws.

Yours very truly,

Friends of Trinity River
By: s/ Byron W. Leydecker, Chairman

California Trout, Inc
By: s/ Brian Stranko, Executive Director

Northern California Council/Federation of Fly Fishers
By: s/ Mark Rockwell, Vice President, Conservation

Trout Unlimited of California
By: s/ Stan Griffin, Northern California President

Butte Environmental Council
By: Lynn Barris, Water Policy Analyst

Friends of the River
By: s/ S. Craig Tucker, Ph.D., Outreach Director

California Sportfishing Protection Association
By: s/ John Beuttler, Conservation Director

Pacific Coast Federation of Fishermen's Associations
By: s/ Zeke Grader, Executive Director

Northcoast Environmental Center
By: s/ Tim McKay, Executive Director

cc: The Honorable Dianne Feinstein
The Honorable Barbara Boxer
The Honorable George Miller
The Honorable Mike Thompson
Mr. Kirk Rodgers
Mr. Steve Thompson

ATTACHMENT ONE

Use of a VA Pharmacy Database to Screen for Areas at High Risk for Disease: Parkinson's Disease and Exposure to Pesticides

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J. W. Ashford, MD, PhD, H. C. Kraemer, PhD, and J. Tinklenberg, MD

ABSTRACT

The purpose of this study was to assess whether pharmacy database information from US Department of Veterans Affairs (VA) medical centers could be used to screen for areas of higher Parkinson's disease prevalence in patients exposed to pesticides. The authors used pharmacy data sets and compared the use of antiparkinsonian medications at 2 VA medical centers in California: one in Palo Alto, near the ocean, and one in Fresno, downwind from extensively farmed parts of the Central Valley. They found that patients at Fresno had higher odds ratios (1.5-1.8) for the use of Parkinson's disease medications than patients at Palo Alto. These data are consistent with the observations of prior epidemiologic studies and suggest that VA pharmacy databases can prioritize locations for further epidemiologic research. However, a thorough exploration of alternative explanations is needed to reach definitive conclusions regarding the findings suggested by this method. (*J Geriatr Psychiatry Neurol* 2003; 16:000-000)

Keywords: pesticides; pharmacy database; Parkinson's disease; epidemiolog

A recent meta-analysis[1] drew the conclusion that at the individual level, the odds ratio for the development of Parkinson's disease (PD) with exposure to pesticides was about 2.0 across a variety of studies. Consistent with this finding is another investigation,[2] which matched mortality statistics from California with pesticide use by county and found that the odds ratio for PD with residence in counties with high pesticide use was > 2.0. These were epidemiologic studies seeking to identify risk factors and possible causes of PD. Such studies are difficult to implement in a cost-effective fashion at sites where the prevalence of PD is very low. The purpose of this study was to determine if one can use pharmacy database information from US Department of Veterans Affairs (VA) medical centers to indirectly screen for areas of higher PD prevalence in patients exposed to pesticides, to expedite such epidemiologic studies.

METHODS

We chose to examine the use of antiparkinsonian drugs as an indirect measure of PD. We used local VA clinical pharmacy data sets and compared the use of antiparkinsonian medications at 2 VA medical centers in California. One was in Fresno, which is downwind from extensively farmed parts of the Central Valley. A series of studies designed to examine the effects of pesticide "blow-in" on amphibian populations in the Sierra Nevada Mountains attests that sig-

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This research was supported by National Institute on Aging grant AG17824; the Sierra-Pacific Mental Illness Research, Education, and Clinical Center (MIRECC); and the Medical Research Service of the US Department of Veterans Affairs.

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nificant amounts of pesticide are widely disseminated at a substantial distance from the fields in which they are administered and that Fresno is in the heart of the affected area.[3] The other medical center was in Palo Alto, where the prevailing winds are such that few pesticides could blow in from agricultural areas. Thus, we expected a higher prevalence of PD at the Fresno VA facility than at the Palo Alto facility.

RESULTS

For each of the years from 1997 to 2001, we counted the numbers of patients who were prescribed the common antiparkinsonian drug carbidopa/levodopa at both the Palo Alto and Fresno VA centers. In addition, we counted the total number of patients at each VA center who received drug prescriptions of any kind. Note that a patient may be given prescriptions over the course of several years. The prevalence of carbidopa/levodopa among all prescriptions was then calculated for each year as an indicator of prevalence rates at the Fresno and Palo Alto VA centers (see Table 1).

Table 1. Differential Antiparkinsonian Medication Prescriptions per Patient at the Fresno and Palo Alto, California, Veterans Affairs Facilities

	1997	1998	1999	2000	2001
Fresno					
Carbidopa/levodopa prescriptions	111	154	176	182	210
Total prescriptions	10,256	13,594	14,491	14,599	16,487
Antiparkinson prescriptions/all prescriptions	0.0108	0.0113	0.0121	0.0125	0.0127
Palo Alto					
Carbidopa/levodopa prescriptions	176	188	211	225	290
Total prescriptions	23,795	27,386	30,048	31,961	34,557
Antiparkinson prescriptions/all prescriptions	0.0074	0.0069	0.0070	0.0070	0.0084
Odds ratio (Fresno/Palo Alto)	1.5	1.6	1.7	1.8	1.5
Lower 95% confidence interval	1.1	1.3	1.4	1.5	1.3
Upper 95% confidence interval	1.9	2.1	2.1	2.2	1.8

DISCUSSION

The odds ratios of 1.5 to 1.8 for PD at Fresno, which we calculated using VA pharmacy data, are consistent with the observations of other individual studies, cited above, which found higher odds ratios for PD with higher pesticide exposure. This suggests that VA pharmacy databases may be used to screen for areas particularly relevant for study in large-scale epidemiologic work. Recently, the VA has created a consolidated national database that will contain similar data to those used in this study. This technique may be of use in other situations in which a medication is consistently used for one indication and rarely used for any others. In the future, information from the national pharmacy database, which is collected by the Pharmacy Benefits Management Strategic Heath Group of Hines, Illinois, may also be merged with clinical data from the VA's main database in Austin, Texas. Such merges, though technically possible, are difficult and time consuming because of the many administrative and security approvals necessary. They are also subject to problems associated with the potential for incompleteness, inaccuracies, and incomparability in data abstracted from essentially clinical sources. Nonetheless, it is expected that more analyses will be performed with merged clinical and pharmacy data because that will allow substantially richer analyses, including, for example, diagnostic and extensive psychosocial information.

Despite the potential usefulness of this approach to screen for areas that might be at high risk for the development of PD, we emphasize the preliminary nature of our report, and there are a number of important methodological considerations and limitations that must be emphasized. We assumed in our analyses that disease misdiagnosis rates and drug utilization rates are similar between VA hospitals. This fact, however, is not established, and one might be able to argue, for example, for the existence of hospital-to-hospital differences between urban and rural areas, between teaching hospitals and others, between hospitals serving older populations and those serving younger populations, and between hospitals with greater smoking rates and those with lower rates. The identification of hospitals with greater prevalences of PD might be enhanced by the consideration of such sources of "ecological" differences. In fact, the database itself might be used to determine if prescribing practices differ across sites.

However, the "ecological fallacy" refers to attempting to draw inferences at the individual level from analyses done at the ecological (here, hospital) level. Thus, finding sources of interhospital differences could not be interpreted as finding risk factors for PD, and certainly, one cannot draw causal inferences from observational studies. Thus, although the VA medication database can become a useful screening tool to identify sources of patients for epidemiologic studies, any attempt at conducting a valid epidemiologic study would require the sampling of individual patients within each source, careful diagnosis, and the collection of many other types of information.

We also note that if all PD patients were treated with carbidopa/levodopa, and non-PD patients were never prescribed the drug, its prevalence would be exactly equal to that of PD. On the other hand, some patients with PD may not be properly diagnosed or may not be treated with the drug, and some non-PD patients may be treated with the drug. In that case, the prevalence of the drug would be highly correlated with, but not equal to, the prevalence of PD. The odds ratio of the prevalence of the drug's use

would be an attenuated estimate of the prevalence of PD at each site. Under the assumption that the false positive and false negative rates are similar across VA sites, the odds ratio of the prevalence of the drug's use would be an attenuated estimate of the odds ratio of the prevalence of PD. Across multiple sites, the odds of the prevalence of the drug's use would order the sites in the same order as would the odds of the prevalence of PD.

The questions also arise of what one might do with this information and why one needs to be concerned with screening for areas of high PD prevalence. We expect that some of the excess PD found in the vicinity of Fresno County may be due to both agricultural workers' pesticide exposures and drift blow-in to nonagricultural workers who may be susceptible to the disease. One possible application is to study ecological correlations in more detail. For example, if one wished to test whether exposure to pesticides correlates with PD prevalence at the ecological level, one could sample communities and correlate community exposure and drug prevalence. The database could also be used to study incidence and prevalence rates longitudinally under continuing exposure to an alleged toxin. Furthermore, there is growing literature suggesting that genetic variation may explain why some individuals develop PD after exposure to environmental toxins, whereas others do not.[3-5] Pharmacy database information could be used to help identify geographical areas where genetic variants associated with high vulnerability to neurotoxic exposure are most likely to become clinically (ie, phenotypically) apparent in large, expensive genetic epidemiologic studies.

Thus, it may be that the systematic use of pharmacy database information to identify locations at high risk for the development of PD might form the basis of selecting hospitals with high enough base rates to support detailed and cost-effective epidemiologic studies, randomized clinical trials of new treatments, or efforts to limit the further exposure of patients to pesticides through patient education efforts.

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