



MEDICINAL DRUGS AND TRAFFIC SAFETY - THE NORWEGIAN EXPERIENCE

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Medicinal drugs and traffic safety in Norway

- Medicinal drugs and traffic safety has to be discussed together with illegal drug (and alcohol) among apprehended drivers
- Combinations of several drug groups are frequently found among this group of drivers
- Examples will be given





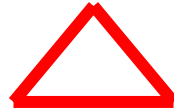
THE NORWEGIAN ROAD TRAFFIC ACT NARCOTIC LAW

- Alcohol legal limit: 0,2 g/l in blood – 0,1 mg/l in breath (since 2001)
- Illegal drugs and **psychoactive medicines**:
Impairment law – (since 1959)- no legal limits
- Illegal to USE narcotic drugs and **psychoactive medicines** if not prescribed
- A driver can be penalized according to the narcotic law if use of illegal drugs or **psychoactive medicines** (if not prescribed) have been confirmed





Psychoactive medicines - warning



- Psychoactive medicines important for traffic safety are marked with a red triangle (and warning information in package inserts)
- Medicinal drugs with potential increased traffic risk have package insert with warning





Psychoactive medicines – information from prescribing doctors and pharmacists

- Prescribing doctors always should warn the patients about accident risks (not systematically done)
- Patients with first time prescription should not drive the first 2-4 weeks (until their reaction is known) and never the first hours after use
- Pharmacists should remind the patients about traffic risks – the red triangle and package inserts
- Based on investigation, this type of information is not given systematically – depending on the pharmacist – the patient or other situations





Reasons for apprehension of drivers suspected to be under the influence

- accidents
 - reckless/dangerous driving
 - notifications from other road users (cell phones)
 - well known earlier drugged drivers
 - road-side control
-
- e.g. some kind of unnormal /risk taking actions on the road





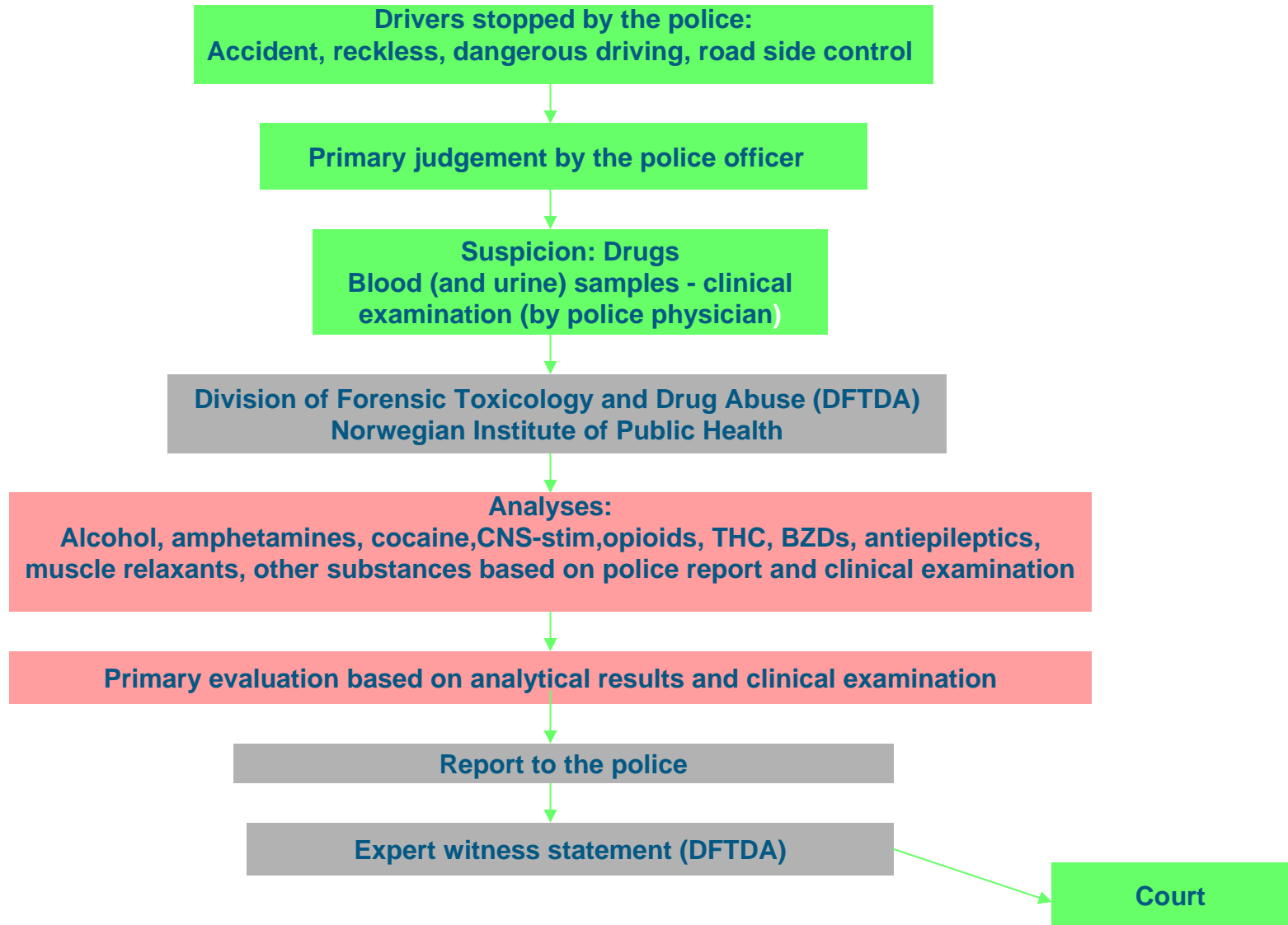
Police investigation road -side

- Alcohol breath tests are used road side without any suspicion
- Negative/low BAC call the attention on other drugs
- Syringes/pills etc in the car may call the attention
- Most police has "DRE training"
- Investigation includes different eye reaction, pulse rate, speech, walking
- No on-side tests (saliva) are used





Handling of drugged driving cases in Norway





Standard analytical program (blood) both illegal and medicinal drugs (> 25 compounds)

- **Alcohol**
- **Amphetamines – ecstasy**
- **Cannabis (THC)**
- **Opiates (morphine, 6-MAM*),**
- **Cocaine**

- **Benzodiazepines, zopiclone, zolpideme, muscle relaxants, some antiepileptics, opioides (morphine, codeine, et.morphine, methadone, buprenorphine)**

- **Other drugs may be looked for on request from the police – or if no drugs are detected in the standard analytical program and impairment has been concluded by the clinical examination**

* Confirmed in urine





Number of drug and alcohol cases/year

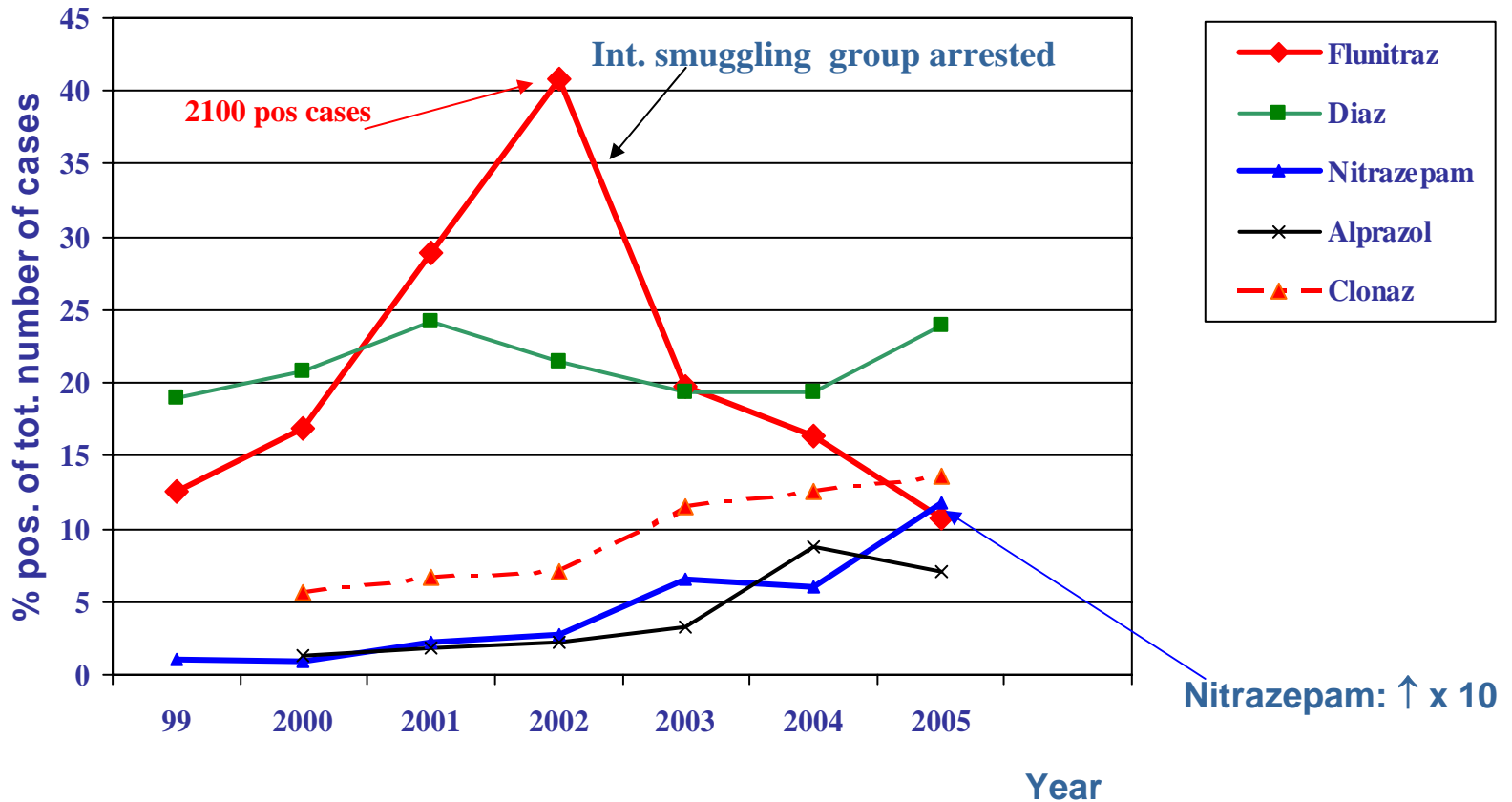
(Norway: 4,5 mill inhabitants)

- The number of drug cases has varied during the last years: From appr. 4000 - > 5100 /year
- One or more drugs detected in appr. 80% of the cases
- Total number of alcohol cases: Similar level as drug cases: appr. 5000 – 5500 /year
BAC > legal limit: 85- 90%





Most frequently detected medicinal drugs among apprehended drivers in Norway % positive



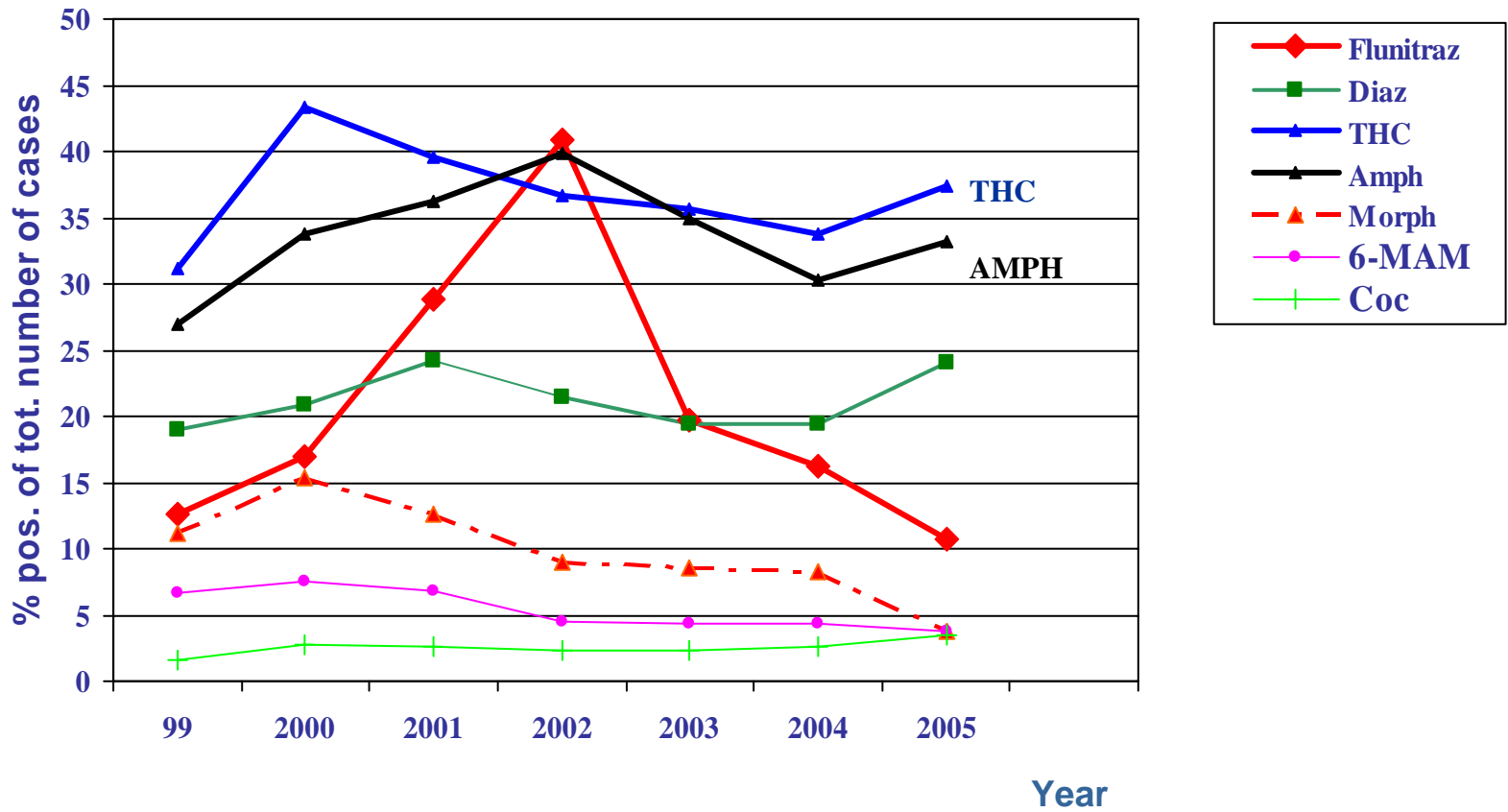
When one drug decrease other similar drugs increase





Most frequently detected illegal drugs compared to some medicinal drugs among apprehended drivers in Norway

% positive



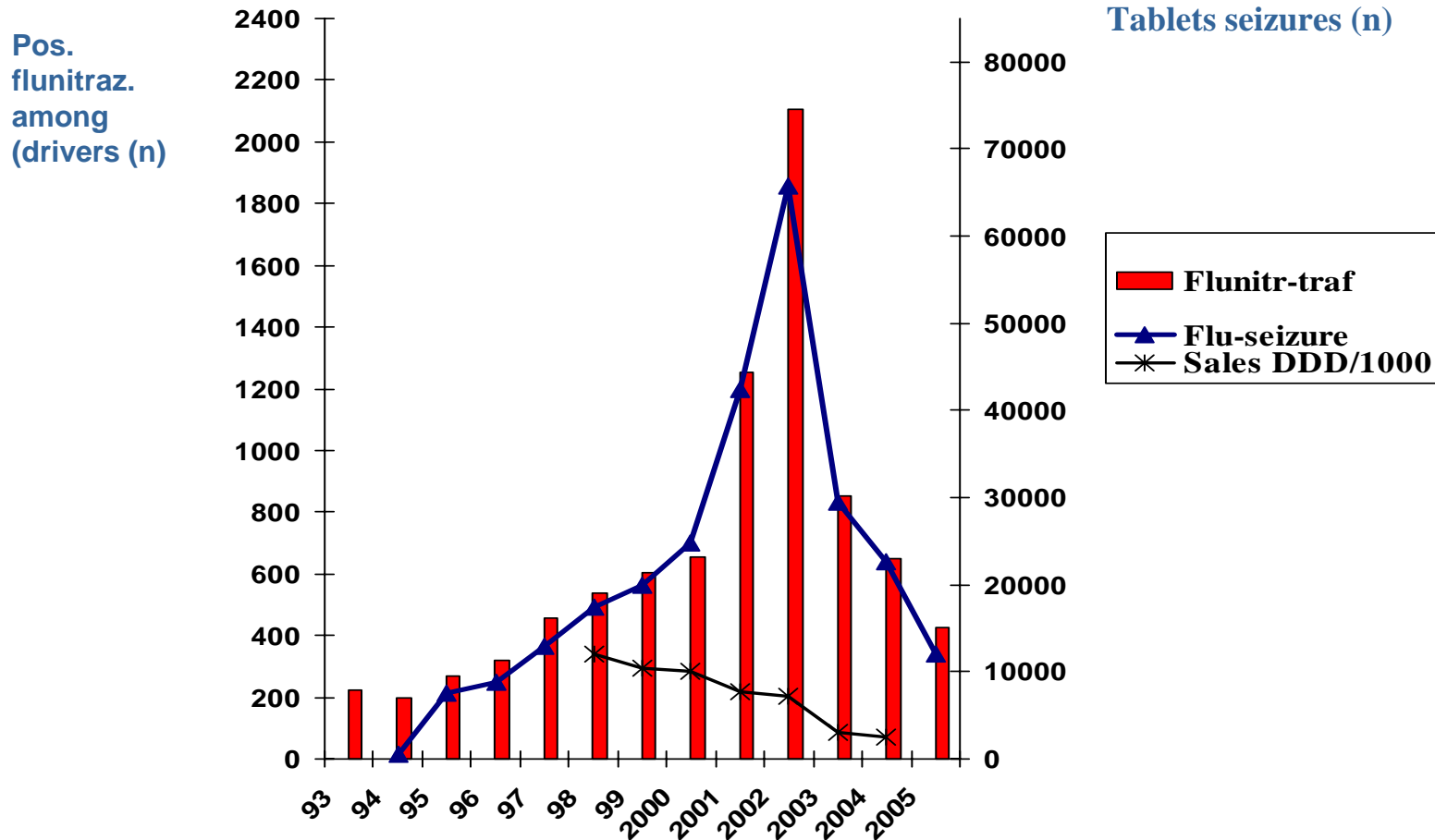
What is the source of medicinal drugs detected among apprehended drivers

- Pharmacies ?
- Illegal marked ?





Comparison of flunitrazepam among apprehended drivers - seizures recorded by costumers/police and sales from pharmacies



Examples of illegal produced BZD-tablets Higher doses compared to products from standard producers

- Alprazolam: from appr. 20 to > 40 mg/tablet –
Highest dose from Norwegian pharmacies: 2,5 mg
- Diazepam: up to 50 mg/tablet
Highest dose from Norwegian pharmacies : 5 mg
- Nitrazepam: > 10 mg/tablet
Highest dose from Norwegian pharmacies : 5 mg
- Flunitrazepam: > 10 mg/tablet
Highest dose from Norwegian pharmacies : 1 mg

Large variations of doses in the different seizure tablets





Characteristics of apprehended drivers with drugs other than alcohol (illegal and medicinal drugs)

- 85% male
- Mean age: 29 years
- Mean number of drugs detected: 2,5 - 3 (few "ordinary" patients)
- High freq. sentences according to the Road Traffic Act (> 70% if impairment has been documented)
- Frequent earlier arrests – high probability to be rearrested
- 50% rearrested after 3 years - twice compared to drunken drivers
- High mortality rate: Appr. X 20 higher than population – same age group

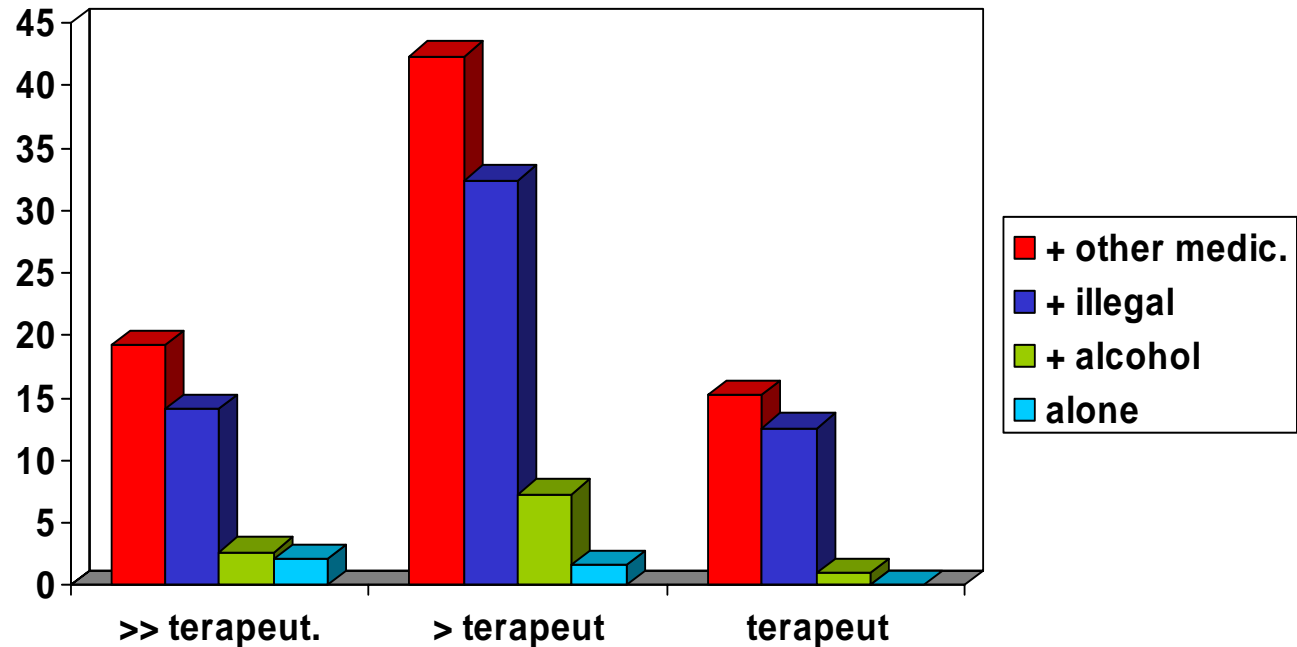




Frequent combination with other drugs

Flunitrazepam (n=672) in blood samples from apprehended drivers – different blood concentrations

% av total detect



Flunitrazepam only – therapeutic level: None

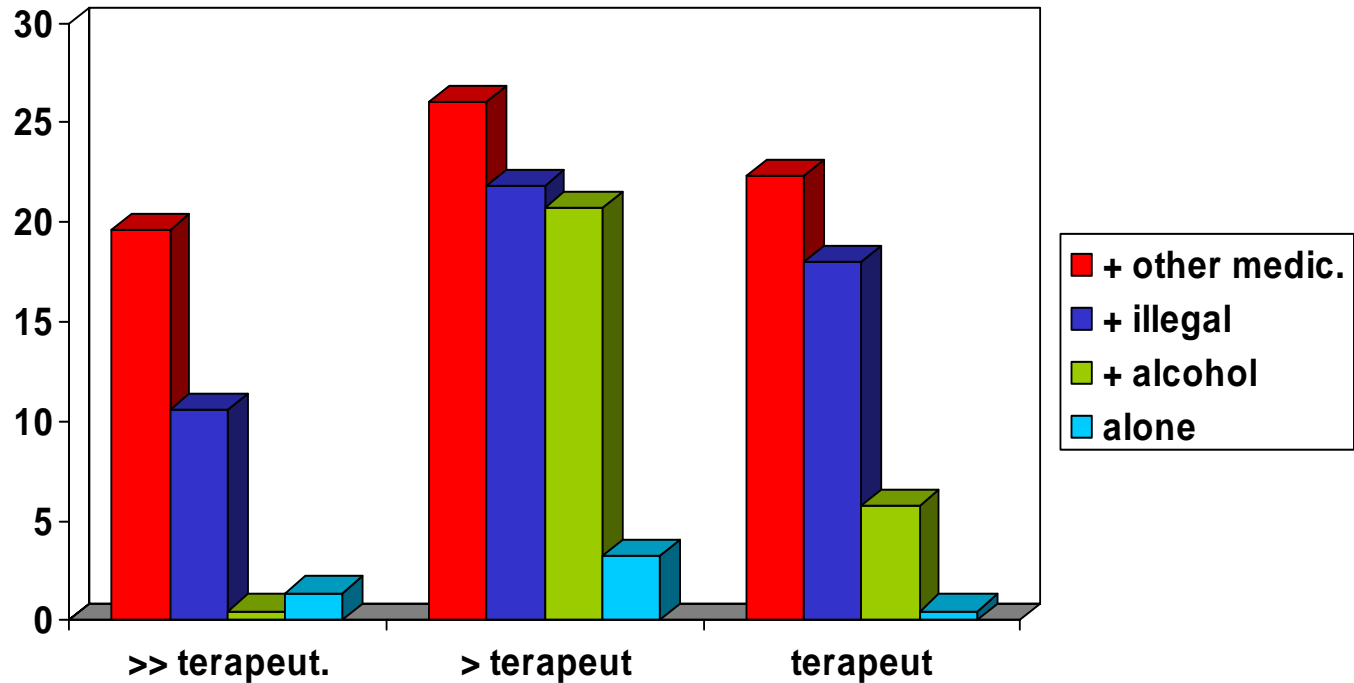




Combination with other drugs

Alprazolam (n=362) i blood samples from apprehended drivers – different blood concentrations

% av tot.funn



Alprazolam only – therapeutic level: 0,5 %

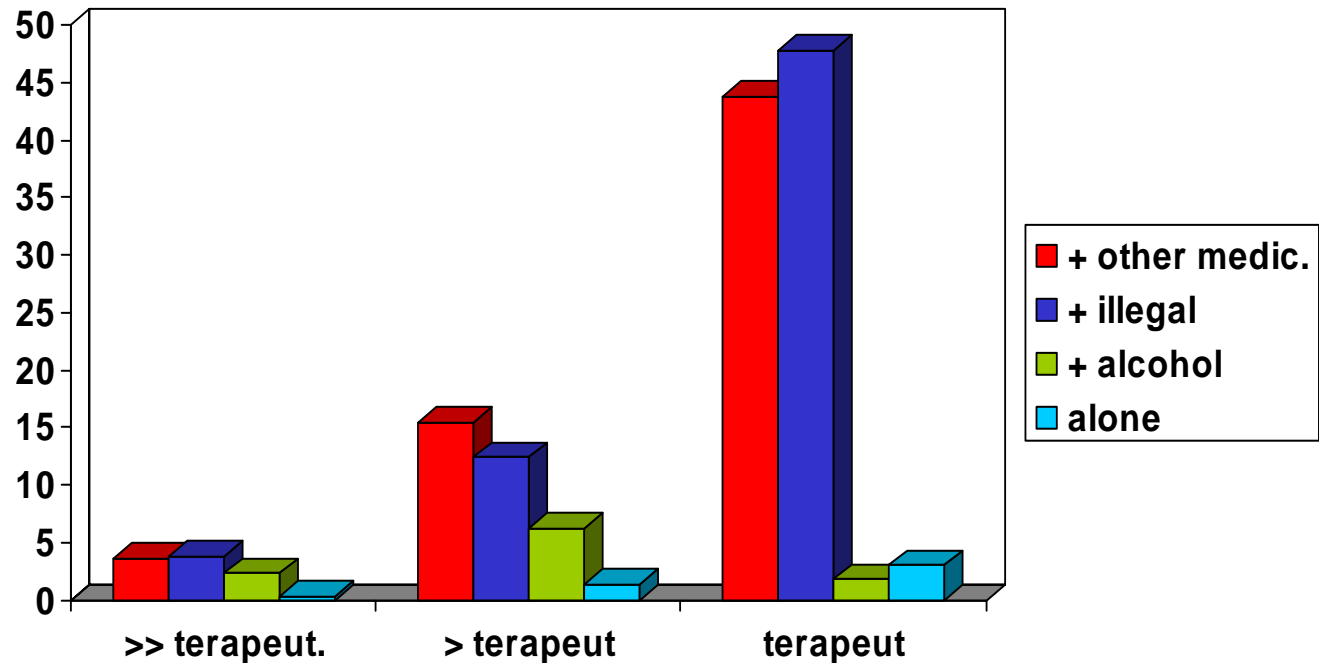




Combination with other drugs

Diazepam (n=672) i blood samples from apprehended drivers – different blood concentrations

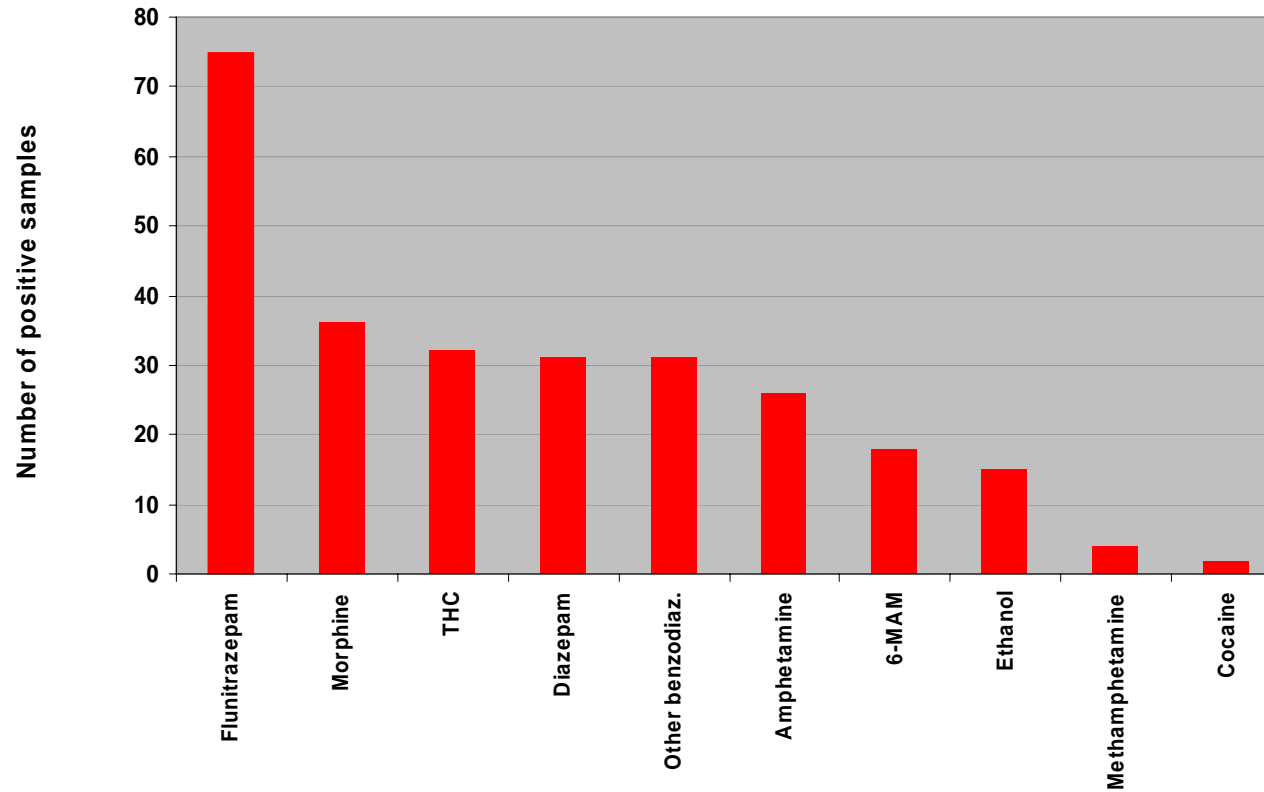
% av tot. detect



Diazepam only – therapeutic level: 3%



Methadone positive samples from apprehended drivers (n=104) combination with other drugs



In < 5% of the cases methadone only was detected



Alcohol, illegal drugs and medicines among fatal accident drivers

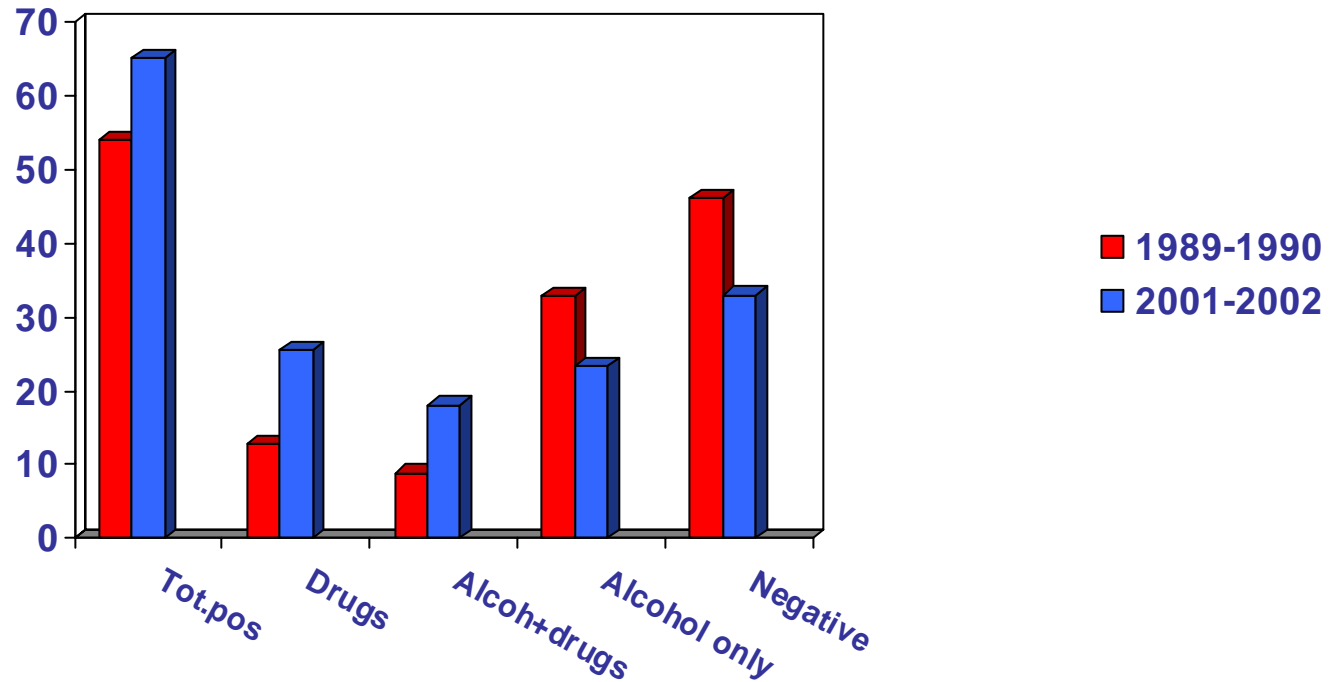
Changes during recent years?





Alcohol and other drugs among single vehicle accident drivers in Norway 1989-1990 (n=79) compared with 2001-2002 (n=92)

Freq.%

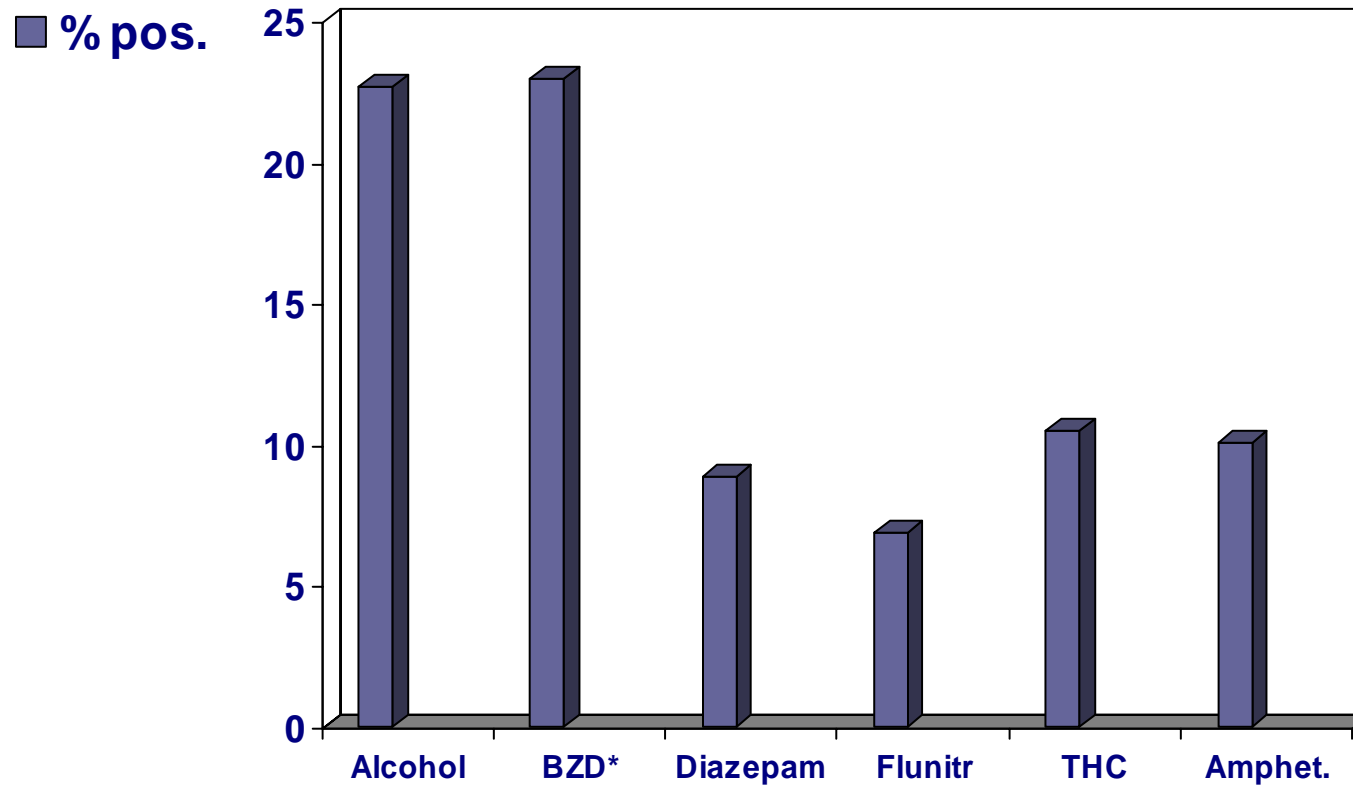


Besides alcohol – BZDs most frequently detected





Most frequently detected drugs among fatal accident drivers in Norway (n=242) all type of accidents (2001-2002)



* Including zopiclone + zolpideme



Fatal accident drivers –

other medicinal drugs included in the analytical program

- **Antipsychotics, antidepressiva, antihistamines were also looked for in the study on fatal accident drivers**
- **Minor positive findings and mainly in combination with alcohol or psychoactive medicinal drugs**





Proposals to decrease illegal and medicinal drug related driving in Norwegian road traffic

- **Fixed legal limits** for some frequently detected drugs (illegal and medicines)
- Less time consuming to handle the cases
- **Rehabilitation program** for drivers impaired by drugs – frequent rearrests
- **Focus on young drivers** using several drugs -
- **Withdrawal of driving licence** among misusers
- **Information** - both by prescribing doctors and pharmacists
- Increased focus on drugs during education of driving teachers
- On-side test for medicinal drugs (BZDs) in saliva





Database storing information from alcohol and drug cases in Norway for 20 years

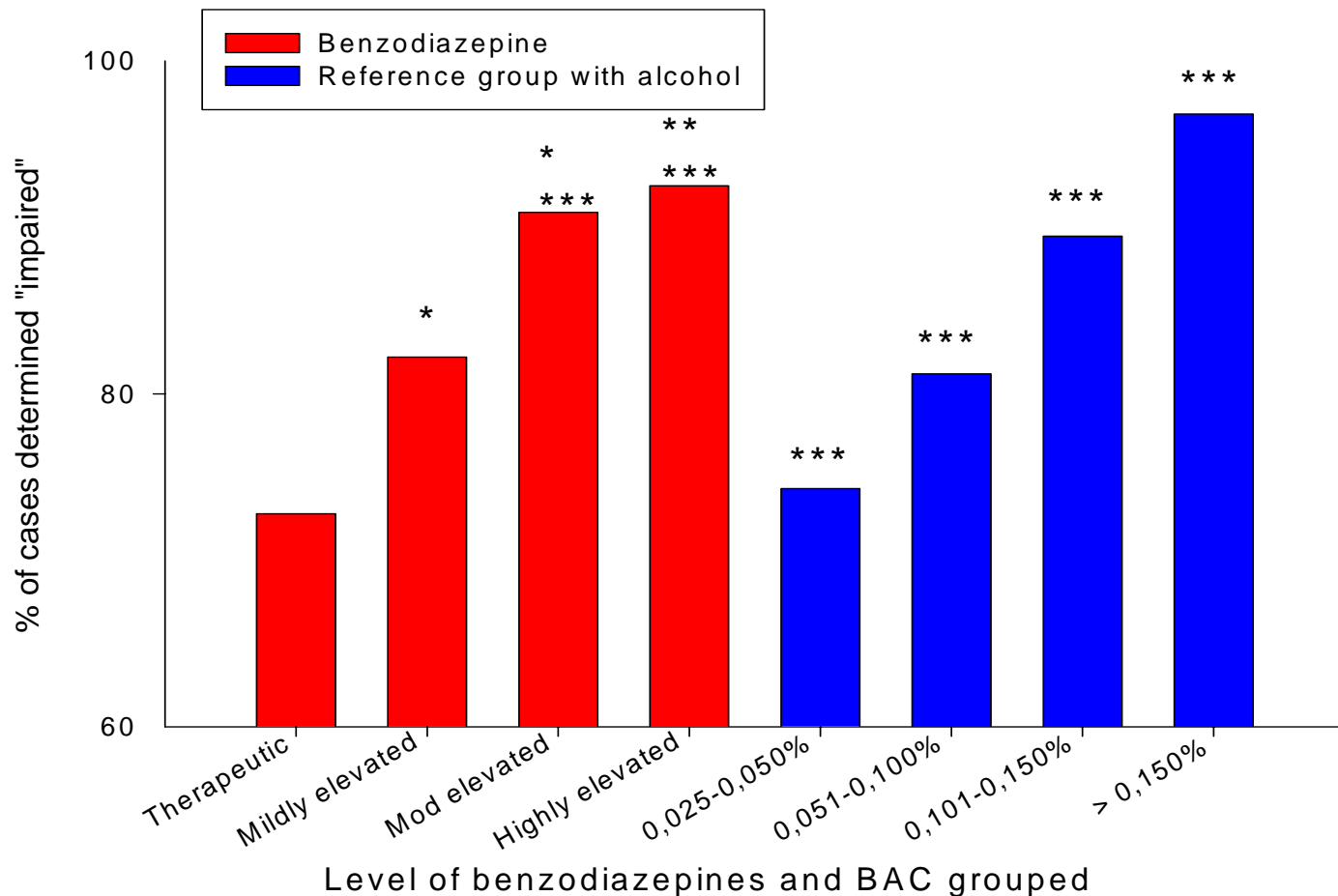
- **Used to study the relationship between blood drug concentrations and impairment evaluated by the time of blood sampling**
- **Single drug cases**
- **Single drug + alcohol**
- **Results can be used as a background to set fixed limits (among other studies)**





Clinical impairment in suspected DUID cases

Concentration-effect relationship for benzodiazepines (n=818) and alcohol (n=10 759)





Codeine

Blood concentration - effect relationship

Cmax after codeine/phosphate p.o.:

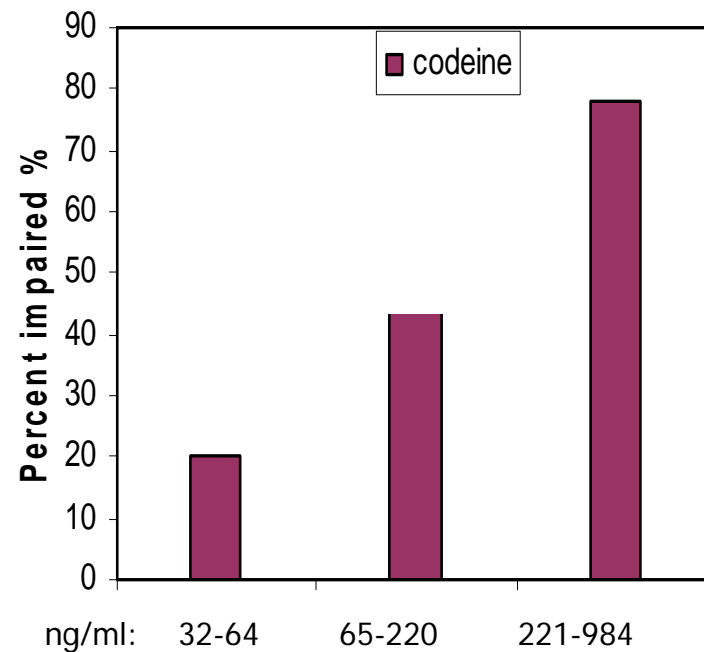
15 - 30 mg: 32 - 64 ng/ml

30 - 100 mg: 65 - 220 ng/ml

100 - 450 mg: 221 - 984 ng/ml

Half life: 3 - 4 hours

Recommended single therapeutic dose: 30 mg



Bachs et al.: Eur. J Clin Pharmacol (2003) 58: 758





New possibilities for studies of medicinal drug related traffic accidents

- **Pharmacoepidemiological approach using of data from Prescription Database (covering all prescriptions performed outside hospitals) to individual patients – combined with Road Traffic Accident registry**
- **The first study shows that natural opium alkaloids (codeine most important), tranquillising and hypnotic BZDs, and NSAIDS significantly increased accident risk**
- **New studies will follow using this register of prescriptions combined with Road Traffic Accident registry**

