Simulation

First we need a dosage regimen for the population we want to simulate. Basically, when and how much of the drug is entering the body, in which compartment, what are the values of the covariates for the subjects.

```julia
julia> ev = DosageRegimen(100, time=0)
DosageRegimen(1×8 DataFrame
```

Row	time Float64	cmt Int64	amt Float64	evid Int8	ii Float64	addl Int64	rate Float64	ss Int8
1	0.0	1	100.0	1	0.0	0	0.0	0

```
)
```

```julia
julia> sub = Subject(id=1,evs=ev,cvs=(isPM=0, Wt=70))
Subject
  ID: 1
  Events: 1
```

The fields of a Subject (sub) contain the details of the dose for the subject

```
id 1
covariates (isPM = 0, Wt = 70)
events PuMaS.Event[Dose event
  dose amount = 100.0
  dose time = 0.0
  compartment = 1
  instantaneous
  interdose interval = 0.0
  infusion start time = 0.0
]
```

Let's generate a random data set of 24 subjects.

```julia
julia> choose_covariates() = (isPM = rand(["yes", "no"]),
                              Wt = rand(55:80))
julia> function generate_population(events,nsubs=24)
          pop = Population(map(i -> Subject(id=i,evs=events,cvs=choose_covariates()),1:nsubs))
          return pop
       end

julia> ev = DosageRegimen(100, ii=24, addl=3)
DosageRegimen(1×8 DataFrame
```

Row	time	cmt	amt	evid	ii	addl	rate	ss
	Float64	Int64	Float64	Int8	Float64	Int64	Float64	Int8
1	0.0	1	100.0	1	24.0	3	0.0	0

```julia
julia> ev1 =  generate_population(ev)
Population
  Subjects: 24
  Covariates: isPM, Wt
```