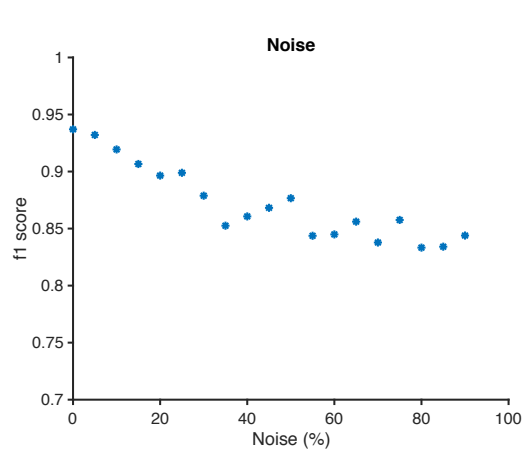


# Effect of noise on f1 score – $k_{\text{Decay}}$ and $k_{\text{Growth}}$ of aggressive from a constant normal distribution $k_{\text{Decay}}$ and $k_{\text{Growth}}$ of non-aggressive from different normal distribution



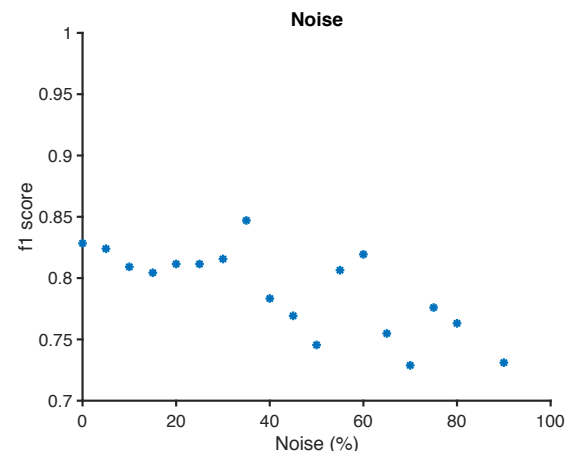
$k_{\text{growth\_non\_agg}} = 1.1\text{e-}10 \pm 9.5\text{e-}11$   
 $k_{\text{decay\_non\_agg}} = 8.3\text{e-}11 \pm 1.1\text{e-}10$

$k_{\text{growth\_agg}} = 1.1\text{e-}4 \pm 1.5\text{e-}3$   
 $k_{\text{decay\_agg}} = 3.3\text{e-}2 \pm 6.9\text{-}3$

```
Ch0 = 8; %ng/mL
std_h = 1.5; %ng/mL
Ch0_rnd = std_h.*randn(num_patients,1) + Ch0;
k_gr_non_rnd = normrnd(1e-10, 1e-10, [num_patients,1]);
k_decay_non_rnd = normrnd(1e-10, 1e-10, [num_patients,1]);
```

```
Ca0 = 8; %ng/mL
std_a = 1.5; %ng/mL
Ca0_rnd = std_a.*randn(num_patients,1) + Ca0;
k_gr_agg_rnd = normrnd(1/18/30, 1/60, [num_patients,1]);
k_decay_agg_rnd = normrnd(1/30, 1/150, [num_patients,1]);
```

name:noise\_ns1

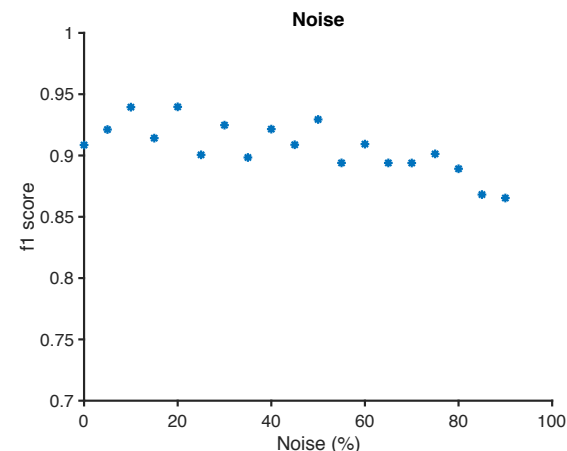


$k_{\text{growth\_non\_agg}} = 1.05\text{e-}4 \pm 1.8\text{e-}3$   
 $k_{\text{decay\_non\_agg}} = 1.1\text{e-}10 \pm 1.11\text{e-}10$

$k_{\text{growth\_agg}} = 2.1\text{e-}4 \pm 1.5\text{e-}2$   
 $k_{\text{decay\_agg}} = 3.3\text{e-}2 \pm 6.3\text{e-}3$

```
Ch0 = 8; %ng/mL
std_h = 1.5; %ng/mL
Ch0_rnd = std_h.*randn(num_patients,1) + Ch0;
k_gr_non_rnd = normrnd(1e-10, 1e-10, [num_patients,1]);
k_decay_non_rnd = normrnd(1e-10, 1e-10, [num_patients,1]);
```

```
%unhealthy baseline and std
Ca0 = 8; %ng/mL
std_a = 1.5; %ng/mL
Ca0_rnd = std_a.*randn(num_patients,1) + Ca0;
k_gr_agg_rnd = normrnd(1/18/30, 1/60, [num_patients,1]);
k_decay_agg_rnd = normrnd(1/30, 1/150, [num_patients,1]);
```

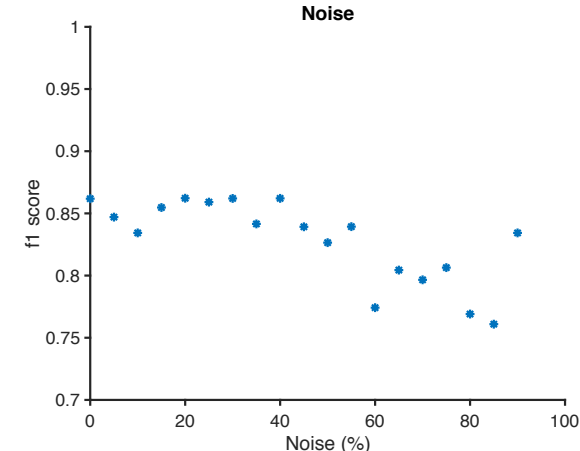


$k_{\text{growth\_non\_agg}} = 8.7\text{e-}11 \pm 9.1\text{e-}11$   
 $k_{\text{decay\_non\_agg}} = 1.7\text{e-}3 \pm 7\text{e-}3$

$k_{\text{growth\_agg}} = 8.2\text{e-}4 \pm 1.7\text{e-}2$   
 $k_{\text{decay\_agg}} = 3.3\text{e-}2 \pm 6\text{e-}3$

```
Ch0 = 8; %ng/mL
std_h = 1.5; %ng/mL
Ch0_rnd = std_h.*randn(num_patients,1) + Ch0;
k_gr_non_rnd = normrnd(1e-10, 1e-10, [num_patients,1]);
k_decay_non_rnd = normrnd(1/(24*30), 1/150, [num_patients,1]);
```

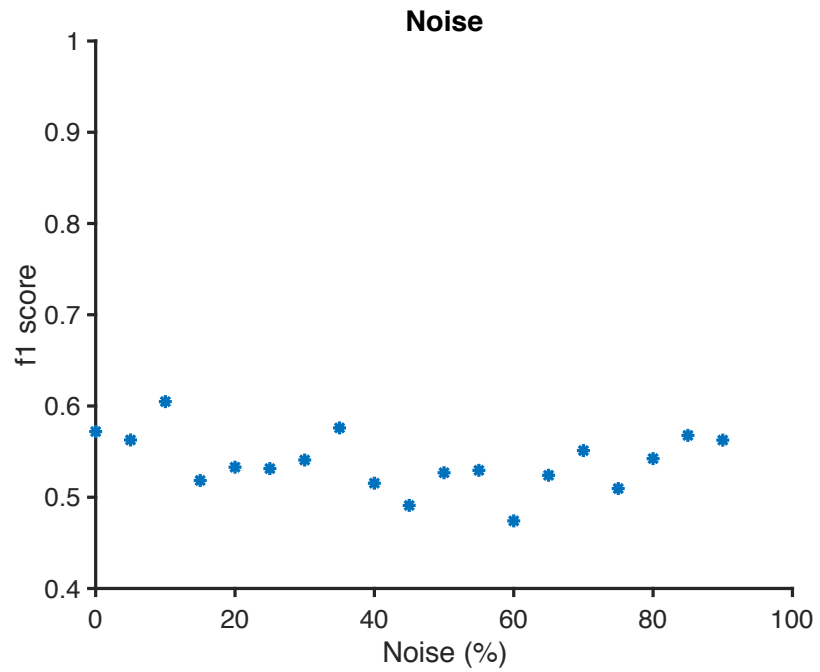
```
%unhealthy baseline and std
Ca0 = 8; %ng/mL
std_a = 1.5; %ng/mL
Ca0_rnd = std_a.*randn(num_patients,1) + Ca0;
k_gr_agg_rnd = normrnd(1/18/30, 1/60, [num_patients,1]);
k_decay_agg_rnd = normrnd(1/30, 1/150, [num_patients,1]);
```



$k_{\text{growth\_non\_agg}} = 5.01\text{e-}5 \pm 1.8\text{e-}3$   
 $k_{\text{decay\_non\_agg}} = 1.6\text{e-}3 \pm 6.2\text{e-}3$

$k_{\text{growth\_agg}} = 1.6\text{e-}3 \pm 1.5\text{e-}2$   
 $k_{\text{decay\_agg}} = 3.2\text{e-}2 \pm 6.4\text{e-}3$

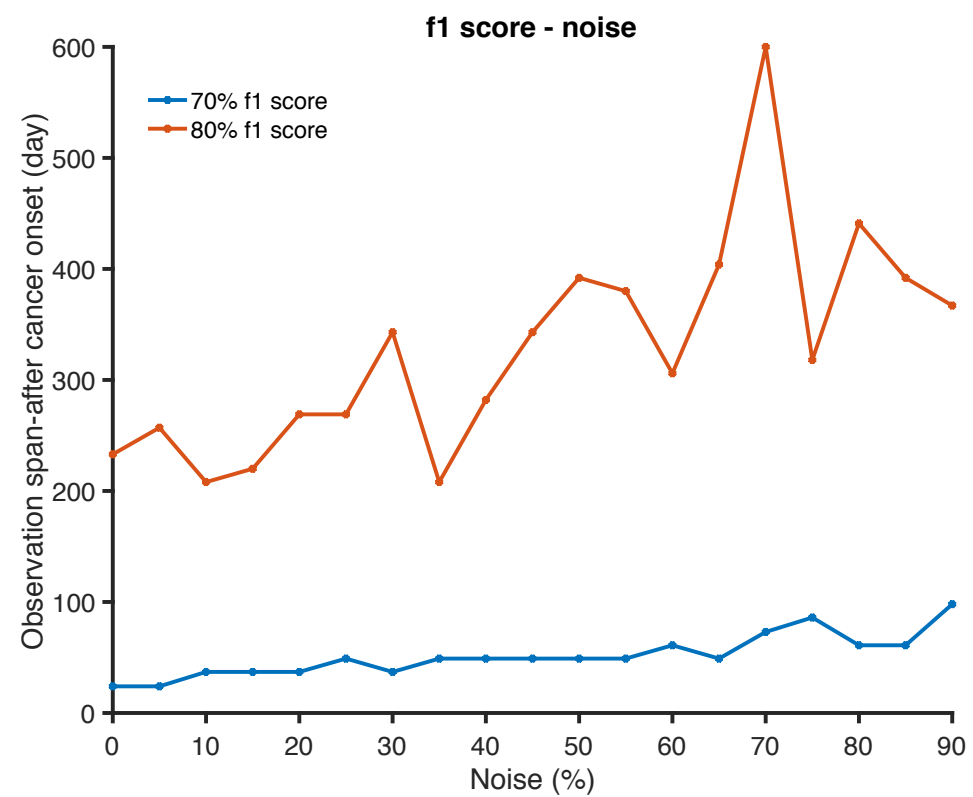
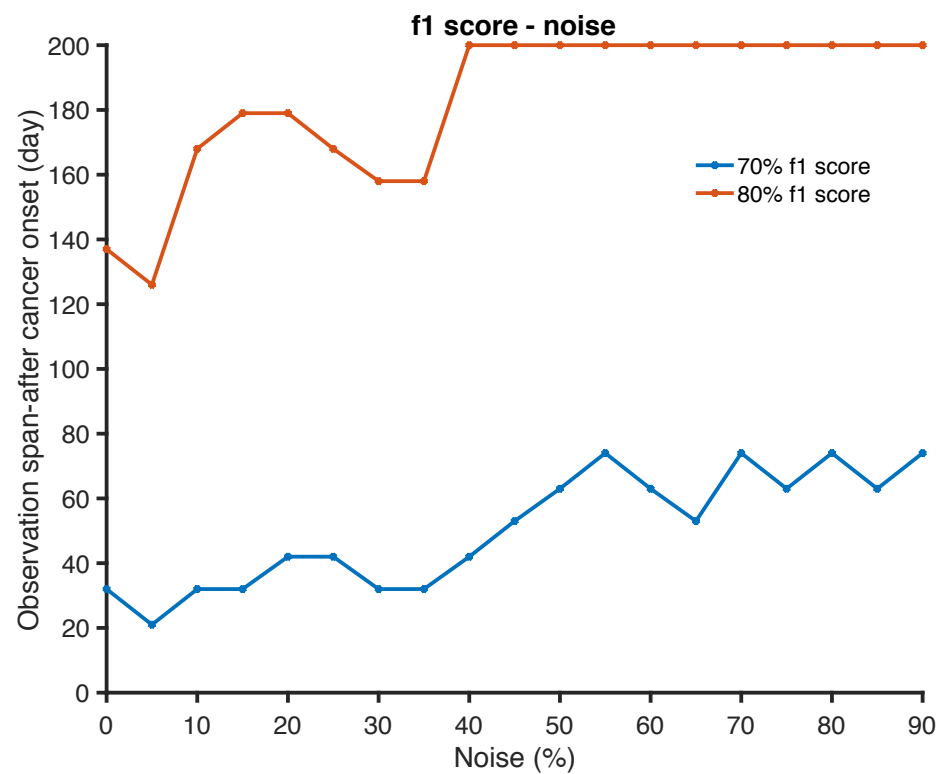
```
Ch0 = 8; %ng/mL
std_h = 1.5; %ng/mL
Ch0_rnd = std_h.*randn(num_patients,1) + Ch0;
k_gr_non_rnd = normrnd(0, 1/18/30, [num_patients,1]);
k_decay_non_rnd = normrnd(1/(24*30), 1/150, [num_patients,1]);
%unhealthy baseline and std
Ca0 = 8; %ng/mL
std_a = 1.5; %ng/mL
Ca0_rnd = std_a.*randn(num_patients,1) + Ca0;
k_gr_agg_rnd = normrnd(1/18/30, 1/60, [num_patients,1]);
k_decay_agg_rnd = normrnd(1/30, 1/150, [num_patients,1]);
```

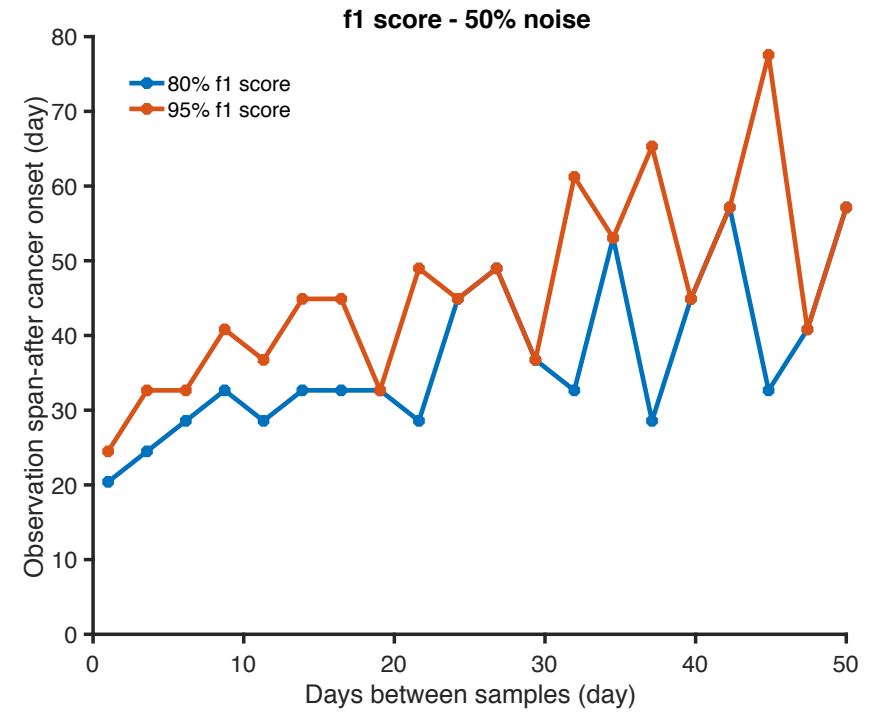
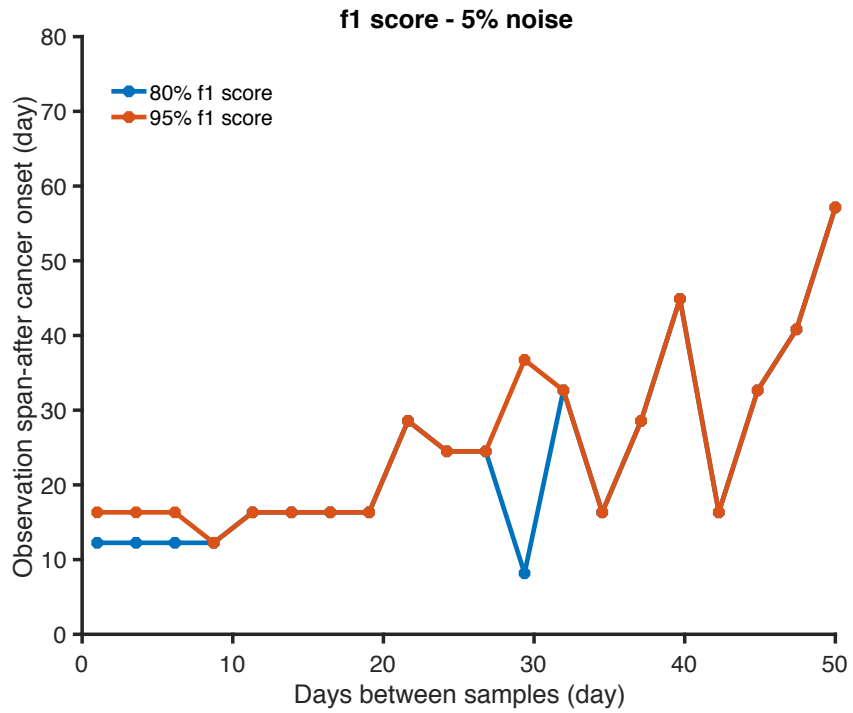


Similar k\_decay and k\_growth for the aggressive and non-aggressive

```
Ch0 = 8; %ng/mL
std_h = 1.5; %ng/mL
Ch0_rnd = std_h.*randn(num_patients,1) + Ch0;
k_gr_non_rnd = normrnd(1/18/30,1/60,[num_patients,1]);%mean([0 1/18/30]);
k_decay_non_rnd = normrnd(1/30,1/150,[num_patients,1]);%mean([1/(24*30) 1/150]);

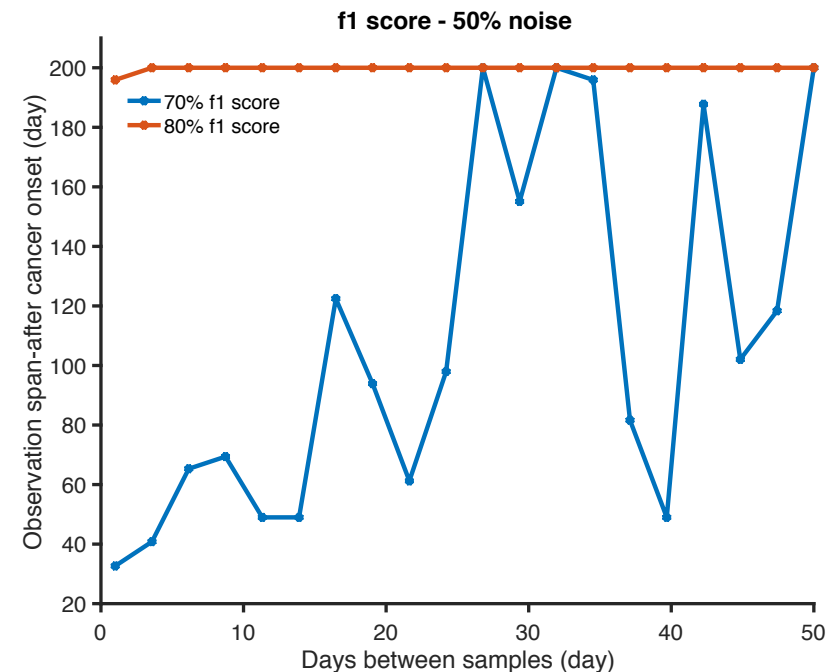
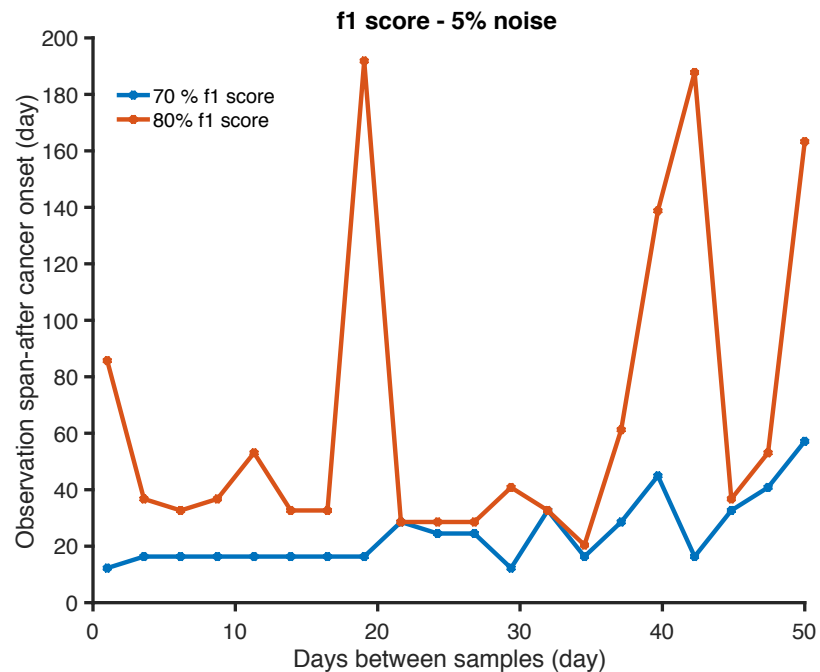
%unhealthy baseline and std
Ca0 = 8; %ng/mL
std_a = 1.5; %ng/mL
Ca0_rnd = std_a.*randn(num_patients,1) + Ca0;
k_gr_agg_rnd = normrnd(1/18/30,1/60,[num_patients,1]);%linspace(1/18/30,1/60,50); %day-1
k_decay_agg_rnd = normrnd(1/30,1/150,[num_patients,1]);%linspace(1/30,1/150,50); %day-1
```





```
time = (0:400)';
num_patients = 200;
Ch0 = 8; %ng/mL
std_h = 1.5; %ng/mL
Ch0_rnd = std_h.*randn(num_patients,1) + Ch0;
Ca0 = 8; %ng/mL
std_a = 1.5; %ng/mL
Ca0_rnd = std_a.*randn(num_patients,1) + Ca0;
k_gr = 1/60;%linspace(1/18/30,1/60,50); %day
k_decay = 1/150;%linspace(1/30,1/150,50); %day
sample_interval = linspace(1,50,20);
observationspan = linspace(200,400,50);
```

name:observation\_sampling\_test\_ns4



```

test_iter = 10;
time = (0:400)';
num_patients = 200;
%healthy baseline and std
Ch0 = 8; %ng/mL
std_h = 1.5; %ng/mL
Ch0_rnd = std_h.*randn(num_patients,1) + Ch0;
k_gr_non_rnd = normrnd(0,
1/18/30,[num_patients,1]);%mean([0 1/18/30]);
k_decay_non_rnd = normrnd(1/(24*30),
1/150,[num_patients,1]);%mean([1/(24*30) 1/150]);

%unhealthy baseline and std
Ca0 = 8; %ng/mL
std_a = 1.5; %ng/mL
Ca0_rnd = std_a.*randn(num_patients,1) + Ca0;
k_gr_agg_rnd =
normrnd(1/18/30,1/60,[num_patients,1]);%linspace(1/18
/30,1/60,50); %day-1
k_decay_agg_rnd =
normrnd(1/30,1/150,[num_patients,1]);%linspace(1/30,1
/150,50); %day-1

```

